U.S. Coast Guard Research and Development Center
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Report No. CG-D-05-99

Fire Safety Analysis of the 270' WMEC Medium Endurance Cutter

FINAL REPORT
OCTOBER 1998

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National Technical Information Service, Springfield, VA 22161

19990427 060

Prepared for:

U.S. Department of Transportation
United States Coast Guard
Systems (G-S)
Washington, DC 20593-0001

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Technical Report Documentation Page

1. Report No.	2. Government Accession Number	3. Recipient's Catalog No.
CG-D-05-99		

4. Title and Subtitle

Fire Safety Analysis of the 270' WMEC Medium Endurance Cutter

5. Report Date
OCTOBER 1998

6. Performing Organization Code
Project No. 3309.88 / UDI 18

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8. Performing Organization Report No.
R&DC 20/97

9. Performing Organization Name and Address

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Groton, CT 06340-6096

10. Work Unit No. (TRAIS)
SHRD Report No. 116

11. Contract or Grant No.
DTCG39-96-F-E00073

12. Sponsoring Organization Name and Address

U.S. Department of Transportation
United States Coast Guard
Systems (G-S)
Washington, DC 20593-0001

13. Type of Report & Period Covered
Final Report
June 1996 – October 1998

14. Sponsoring Agency Code
Commandant (G-SEN)
U.S. Coast Guard Headquarters
Washington, DC 20593-0001

15. Supplementary Notes
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16. Abstract (MAXIMUM 200 WORDS)

This report documents the results of a comprehensive fire safety analysis of the 270' WMEC Medium Endurance Cutter. The Ship Fire Safety Engineering Methodology (SFSEM) and associated computer program, SAFE version 2.2, were utilized as an analytical tool to perform the analysis. The SFSEM is a probabilistic based fire risk analysis methodology. It is useful to conduct a structured and comprehensive analysis of the performance of all types of surface ships as a fire safety system. The SFSEM provides an integrated framework for analyzing fires on ships in comparison to established fire safety objectives. It accounts for all relevant aspects of fire safety including the growth and spread of fire, the effectiveness of passive design features such as barriers, and active fire protection features such as fixed and portable fire extinguishing systems, as well as manual fire suppression.

SAFE implements the SFSEM and evaluates the probability of space and barriers limiting a fire. The evaluation is conducted on a compartment-by-compartment basis. SAFE calculates the probable paths of fire spread for a user-specified time duration. SFSEM/SAFE has been successfully used to analyze the fire safety design of existing, as well as proposed ships.

The input data was based on information collected during a ship visit to the CGC SPENCER (WMEC 905) during the period 22-24 July 1996. Baseline fire safety analysis results show that with all passive and active fire protection features in effect, all compartments in the cutter exceed established fire safety objectives, both in port and at sea. With just passive fire protection in effect (without considering automated or manual fire protection), one compartment in the 270' WMEC fails to meet fire safety objectives in port and sea. Passive protection must be augmented by manual fire protection for all compartments to meet or exceed fire safety objectives in port and at sea.

Probable rooms of origin for fires that may spread to involve multiple compartments include the Engine Room, 3-103-0-E, and the Auxiliary Machinery Spaces (2-82-0-E and 3-82-0-E). A careful analysis of the results from the various output options in SAFE provided in this repot may be effectively used to develop realistic fire scenarios to assist the crew in planning firefighting training drills.

17. Key Words	18. Distribution Statement
fire protection, cutter, fire safety, ship fire, engineering methodology	This document is available to the U.S. public through the National Technical Information Service, Springfield, VA 22161

19. Security Class (This Report)	20. Security Class (This Page)	21. No of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED		

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EXECUTIVE SUMMARY

This report documents the results of a comprehensive fire safety analysis of the 270' WMEC Medium Endurance Cutter class as part of the Fire Safety Analysis of Cutters project. The Coast Guard selected CGC SPENCER (WMEC 905), Boston, MA, as representative of the class to be analyzed.

The Ship Fire Safety Engineering Methodology (SFSEM) and Ship Applied Fire Engineering (SAFE v2.2) computer program were utilized as an analytical tool to perform the analysis. The SFSEM is a probabilistic based fire risk analysis methodology, which provides an integrated framework for analyzing fires on ships in comparison to established Fire Safety Objectives (FSO). The SFSEM accounts for all relevant aspects of fire safety including the growth and spread of fire, the effectiveness of passive design features such as barriers, and active fire protection features such as fixed and portable fire extinguishing systems as well as manual fire suppression.

SAFE implements the SFSEM and evaluates the probability of spaces and barriers limiting a fire. The evaluation is conducted on a compartment-by-compartment basis. SAFE calculates the probable paths of fire spread for a user-specified time duration. SFSEM/SAFE has been successfully used in the past to analyze the fire safety design of existing, as well as, proposed ships.

SAFE input data were based on information collected during a ship visit to CGC SPENCER during the period 22-24 July 1996. In addition to collecting information necessary to develop the input data to run SAFE, a fire safety audit was conducted during the ship visit. The fire detection system consists of a zoned system that is subject to frequent false alarms with several detectors located within ventilation ductwork, which the crew seemed unaware of. There is a potential problem with the secondary means of egress from the Ordnance Workshop (2-40-1-Q). Several decks contain joiner bulkheads that terminate at the drop ceiling rather than continuing all the way to the deck above. This increases the likelihood that fire and smoke could travel between these spaces. Open doorways between the Crew Mess, Scullery and Galley also create one open room for smoke and fire to travel in.

Baseline fire safety analysis results in previously analyzed cutters indicate that fire protection levels in most compartments, with passive, automated, and manual fire protection measures in effect, generally meet fire safety objectives. Results of the baseline fire safety analysis of the 270' WMEC are consistent with these results and are in agreement with historical records for fires in U.S. Coast Guard cutters. With just passive fire protection in effect (without considering automated or manual fire protection), one compartment in the 270' WMEC fails to meet FSOs and one is very close to failing to meet FSOs. Passive protection, augmented by manual fire protection improves the margin of safety such that all compartments meet or exceed FSOs. Passive protection, augmented by automated fire protection, slightly improves the margin of safety (i.e. one compartment fails to meet FSOs and one is very close to failing to meet FSOs) due to the general lack of automated fire protection systems installed in the 270 WMEC.

By exercising the various output options available in SAFE, insight into probable rooms of fire origin and the sequence of compartments that are likely to be involved in fire paths from

these rooms may be obtained. Results indicate that the most probable rooms of origin for fires that may spread to involve multiple compartments include the Engine Room (3-103-0-E) and the two Auxiliary Machinery Spaces (2-82-0-E and 3-82-0-E). A careful analysis of the results from the various output options in SAFE documented in this report may be effectively used to develop realistic fire scenarios to assist the crew in planning fire fighting training drills.

Two issues were studied in the analysis of alternatives phase of this project. First, an analysis of the non-continuous joiner bulkheads permits insight into the magnitude of the impact on the overall fire safety of the cutter. Second, the hypothetical installation of automated fire protection systems in the Engine Room and Auxiliary Machinery Spaces was studied to determine and quantify the improvement in baseline fire safety levels. CO_2, FM-200 (Halon Alternative), Water Mist and AFFF Sprinkling systems hypothetically installed in the Engine Room and Auxiliary Machinery Spaces were studied. The following are the major conclusions from this phase of the project:

Non-Continuous Joiner Bulkhead Study:

- While eliminating all non-continuous joiner bulkheads (i.e. modeling all joiner bulkheads continuing to the underside of the deck above) increased the vessel's margin of fire safety, it was only a slight increase.

Alternative Automated Systems:

- Addition of any alternative automated suppression system (FM-200, Water Mist, or CO2) in the Auxiliary Machinery Spaces results in only a slight increase in the vessel's margin of fire safety.

- The results of this analysis show that, while the installation of an automated system in the Engine Room improves the margin of safety, the Engine Room presently exceeds fire safety objectives without an automated system by relying on existing passive and manual fire protection efforts. Also of importance is that this class of cutter was not designed or constructed to meet current SOLAS/CFR requirements for automated fire protection systems in the Engine Room as some recent Coast Guard cutters have been. These two facts support maintaining the current configuration of Engine Room fire protection features. It is noteworthy that the current practice of installing automated suppression systems in Engine Rooms arises from loss history, which indicates that the majority of costly fires originate in Engine Rooms. This is indicative of the substantial threat of a class B fire. Moreover, a large fire in the Engine Room would undoubtedly render the cutter unable to conduct Coast Guard missions for a significant period of time until costly repairs could be accomplished. These potential impacts must be weighed against the relative cost of retrofitting this class of cutters with an automated suppression system in the Engine Room.

The appendices in this report include the AutoCAD drawings and comprehensive tables of input data used to populate the baseline data set in SAFE. The detailed spreadsheets for calculating the probabilities of flame termination are included as supporting data. SAFE outputs from running the target, barrier, and path output options that comprise the baseline fire safety analysis results are also documented. The output data from the analysis of alternatives phase are also included.

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A Curve - The resulting curve when A values for increasing areas of a compartment are plotted on a graph with probability of flame limitation on the ordinate axis (logarithmic scale) with the origin at the top left and the deck area of the compartment on the abscissa axis (linear scale). See "A Value".

A Value (%) - The probability that an automated fixed fire protection system installed in a compartment will successfully extinguish the fire before FRI occurs given that the fire did not self-terminate and was not extinguished by manual firefighting efforts. Each compartment is assigned three A-values: the probability of flame limitation given EB in the room of origin, the probability of flame limitation given EB has occurred in the room as a result of a thermal (T-bar) failure of a barrier, and the probability of flame limitation given EB has occurred in the room as a result of a durability (D-bar) failure of a barrier. In SAFE, these values are abbreviated OA, TA and DA respectively

Active Fire Protection - Fire protection features designed to limit flame movement by automatic detection, automatic/automated fire extinguishing systems, and manual suppression systems or equipment. Examples of active fire protection features are: automatic sprinkler systems, fire extinguishers, and trained firefighting teams. See "Passive Fire Protection".

AFFF - Aqueous Film Forming Foam. A firefighting agent particularly effective against class B fires.

Alpha (kilowatts per second squared) - The fire growth coefficient in the pre-FRI heat release rate algorithm. Values for alpha are established for each fire growth model as documented in the SAFE User Manual, Version 2.2. See "Fire Growth Model" and "Pre-FRI Heat Release Rate".

Alternative Data Set - Data sets identified as "Alternative" have had the SAFE baseline input values adjusted, as necessary, to reflect the impact of the proposed alterations or modifications which affect the ships' firesafety system. See "Baseline Data Set".

ASTM E119 Test Rating (hours and minutes) - A rating in hours and minutes specifying time to failure of a material in the standard fire test conducted in accordance with the requirements of ASTM E-119 standardized test.

AutoCAD - Commercially available Computer Aided Design (CAD) software used to display the plan views of a ship's compartmentation on each deck level.

Barrier - Any vertical or horizontal surface which tends to impede, slow, or stop the spread of heat, flames, and combustion products from one space to another. In a ship, barriers may be bulkheads (joiner, watertight, or structural), decks or overheads. See "Zero-Strength Barrier".

Baseline Data Set - Data sets identified as "Baseline" utilize input values to the SAFE program based on the physical condition of the ship found during the ship visit and are not influenced by any modifications or alterations which may be proposed as a result of an analysis. See "Alternative Data Set".

Blackout - The cessation of visible flaming (not to be mistaken for extinguishment which is the cessation of combustion).

Bulkhead - The equivalent in a ship to a wall in a building. Bulkheads can be structural or joiner, insulated or bare. They may be constructed of aluminum, steel, or composite such as marinite or nomex. Together with overheads, they serve to segment the ship into various compartments.

CBO (minutes) - Compartment Burnout - The point in the fire growth curve where complete consumption of all fuel due to pyrolysis occurs.

Ceiling Point - The point in growth of a compartment fire when the flames first touch or involve the ceiling.

Cellulosics - One of two classifications of fuel on board ship. Cellulosics are characterized as ash-producing; examples are wood, paper, and textile products. See "Fuel Load" and "Petro-Chemicals".

Class A Fire - A fire involving cellulosic type products (wood, cotton, paper, etc.) that produce ash as a combustion product. Water is the primary firefighting agent and extinguishes the fire by cooling the fuel below the ignition point. See "Class B Fire" and "Class C Fire".

Class B Fire - A fire involving flammable liquids (fuel oil, lube oil, gasoline, etc.) that burn vigorously without producing ash. AFFF is the primary firefighting agent and extinguishes the fire by smothering the fire with a thick layer of foam that floats on the surface of the fuel. See "Class A Fire" and "Class C Fire".

Class C Fire - A fire involving energized electrical equipment. Class C fires frequently involve class A or B fires as well. Electrical fires are usually extinguished when the electrical power to the affected equipment is secured, however the associated class A or class B fire may continue to burn. CO_2 is the primary firefighting agent and extinguishes the fire by smothering the fire without damaging electrical or electronic components. See "Class A Fire" and "Class B Fire".

CO_2 - Carbon Dioxide. A firefighting agent particularly effective against class C fires.

Combustion - Rapid oxidation in which a fuel pyrolizes or turns into a vapor and mixes with oxygen at an extremely rapid rate accompanied by the release of intense heat and light, visible as flames. See "Fire" and "Pyrolysis".

Compartment - An enclosed space in a ship usually identified with a unique identifying number consisting of deck, forward frame, relation to centerline, and a letter designating the function or type of compartment. See "Plan ID".

Condition of Readiness - One of three material conditions of readiness set by the Commanding Officer of a military ship. All accesses such as doors, hatches and scuttles, and other fittings having damage control value, are labeled X, Y, or Z. In condition "XRAY" all YOKE and ZEBRA accesses and fittings are open and those labeled XRAY are closed; in condition "YOKE" all ZEBRA accesses and fittings are open while those labeled XRAY and YOKE are closed; in condition "ZEBRA", all accesses and fittings are closed.

Configuration - The type of fire protection under consideration in a given fire scenario for a SAFE computer model run. Options include Passive only (I), Passive and Automatic Detection/Fixed Fire extinguishing (I and A), Passive and Manual suppression (I and M), or all three (I, A, and M)

CUI - Compartment Use Indicator - An abbreviated designation for a compartment selected from a list provided in SAFE used to define the type or function of the compartment and establish default values for various fire parameters.

Cum-L (%) - The accumulated probability that a fire will be limited (thus points on an "L-curve") in this or some previous compartment in a particular fire path. "1 - Cum L", therefore, is the probability that the fire will spread.

D-Adjust (%) - A user-specified parameter that can range from 0 to -99% to modify the D-bar values for a barrier. Usually used to account for deterioration of the barrier. An open door is not considered a derating of the barrier. See "D-bar".

Data Set - A data set describes those characteristics of a ship which affect its performance as a firesafety system. It includes information describing particular aspects of a compartment such as geometry, construction, fuel type and load, automatic detection and monitoring systems, ventilation and fire protection systems. See "Alternative Data Set" and "Baseline Data Set".

D-bar (%) - The probability of a durability failure of a barrier which would permit significant transfer of heat into the adjacent compartment.

Deck - The equivalent in a ship to a floor in a building. Decks can be continuous or stepped, insulated or bare. They can be constructed of aluminum, steel, or composite such as nomex. They can be covered with tile, carpet, or a poured floor covering such as terrazzo on one side and sheathing, insulation or both on the other. Together with overheads and bulkheads they serve to segment the ship into various compartments.

Destroyed Barrier - When a barrier is "destroyed" in a model run, heat from the burning compartment is transferred to the adjacent compartment if that room is not at full room involvement. The amount of heat transferred is a function of the barrier material and is referred to as residual heat transfer. See "Residual Heat Transfer".

Door - An opening through a bulkhead providing access to a compartment. If a door is open it is equivalent to a durability failure of the associated bulkhead.

Dur IAM (%) - The probability of terminating a fire originating in a compartment due to a durability barrier failure. The probability is calculated from a combination of the I, A, and M curves for that room. If the room is a room of origin, Dur IAM is not applicable.

EB - Established Burning - The point in the fire growth curve between ignition and FRI when the fire starts to grow exponentially with respect to time. In SAFE, it is assumed that this exponential growth varies with the 2nd power of time. EB is usually considered equivalent to a flame 10 inches high. EB also signifies the demarcation between fire prevention and the beginning of the ship's response to the fire.

EEBD - Emergency Escape Breathing Device. This self contained device provides 15 minutes of oxygen to an individual for the purpose of escaping from a fire.

Enclosure Point - The point in the fire growth curve where the fire starts to become influenced by a barrier.

Engineering Judgment - The assessment of risk in a probabilistic model utilizing subjective probabilities. In the SFSEM, engineering judgment is synonymous with an analyst's degree of belief. In this context an analyst is a domain knowledgeable individual whose judgment is augmented by all available data including results of deterministic computer models.

Extinguishment - The cessation of combustion (not to be confused with blackout which is the cessation of visible flaming.)

Failed Barrier - When a barrier has "failed" in a SAFE computer model run, EB is assumed in the adjacent compartment, if that room is not already burning. The failure mode is thermal (T-bar) if the barrier's T-bar > D-bar; conversely if D-bar is >= T-bar, the failure mode is D-bar.

FAL - Frequency of Acceptable Loss. The frequency with which a compartment can sustain a given Magnitude of Acceptable Loss (MAL). The FAL and MAL together establish the firesafety objectives (FSOs) for a given compartment. See "MAL" and "FSO".

FFS - Fire Free State. The status of a compartment relative to fire before ignition has occurred.

Fire - Combustion. Usually destructive and undesirable in a ship. See "Combustion" and "Pyrolysis".

Fire Growth Model - One of 16 models of fire growth defined in SAFE that may be selected by the user to describe the characteristics of the fuel load in a compartment. The fire growth model determines the fire growth coefficient, alpha, and the maximum heat release rate, Qmax. See "Alpha" and "Qmax".

Fire Path - The sequential spread of fire from the compartment of origin through a failed barrier into an adjacent compartment, then through another barrier into another space and so on until the fire is limited. Multiple fire paths occur when failure of more than one barrier in a compartment permits the fire to spread into multiple compartments.

Fire Safety System - A term used to address the overall performance of a ship as it relates to fire safety. It considers the ship as a whole and accounts for such things as compartment geometry, construction, fuel type and load, automatic detection and monitoring systems, ventilation and fire protection systems.

Flashover - A phenomena characteristic of compartment fires denoted by the rapid and sudden propagation of flame through the unburned gases and vapors collected at the top of the enclosure. Flashover is invariably accompanied by full room involvement (FRI). FRI conditions are untenable for humans without self-contained breathing devices.

FLLR - Flammable Liquid Line Rupture. A scenario used in SAFE to model a class B spray fire. The key user defined variables include the amount of fuel due to the rupture that is added to the compartment's fuel load, the room of origin and its associated FRI time and I value.

Frequency of EB (losses per compartment year) - A frequency based on historic fire casualty data compiled from data provided by the U.S. Naval Safety Center and the Coast Guard's MISREP mishap reporting system.

FRI - Full Room Involvement - The point in the fire growth curve when the temperature in a compartment has increased 500C above ambient. FRI conditions include surface burning of all combustibles and survival for unprotected personnel is not possible.

FRI Time (minutes) - The elapsed time from EB to FRI calculated in SAFE using the Peatross/Beyler algorithm. See "FRI".

FSAC - Fire Safety Analysis of Cutters. Project sponsored by the U.S. Coast Guard to analyze fire safety on cutters 180' and greater in length.

FSOs - Fire Safety Objectives - Performance standard, ideally established by cognizant authorities, for a compartment accounting for mission protection, property protection and life safety. The SFSEM is designed to analyze, quantify and compare the ship's performance as a fire safety system to achieve the established FSOs on a compartment basis. The FAL and MAL together establish the FSOs for a given compartment. See "FAL" and "MAL".

Fuel-Controlled Burning - When sufficient ventilation is available, fuel controlled burning will occur. The fire is limited by the fuel surface and fuel quantity available for combustion. See "Ventilation-Controlled Burning".

Fuel Load (BTU's/sq ft) - The total heat energy available for release from combustible materials in a compartment. In SAFE, fuel loads are expressed as fuel load density, where the total fuel load in a compartment is divided by the compartment area. Fuel loads are entered in SAFE for: cellulosics, plastics, and petroleum-based flammable liquids. Cellulosics and plastics are entered in lb/sq ft while flammable liquids are entered as gallons. The heat energy content of cellulosics is approximately 8000 Btu/lb; plastics and flammable liquids are approximately 16000 Btu/lb (flammable liquids are assumed to weigh 8 lb/gallon).

FY - Fiscal Year (For example, FY96 is Oct. 1, 1995 to Sept. 30, 1996).

Halon - Halogenated Hydrocarbon. A firefighting agent particularly effective against all classes of fires, but presently banned from further production in accordance with the Montreal Protocol due to its atmospheric ozone-depleting characteristics.

Hatch - An opening through a deck providing access to a compartment. If a hatch greater than or equal to 400 square inches is open, it is equivalent to a durability failure of the associated barrier.

Heat Energy Impact (HEI) (kBtu/sq ft) - The thermal heat flux to which the barrier is subjected during a fire. See "Pre-FRI Heat Release Rate" and "Post-FRI Heat Release Rate".

I-Curve - The resulting curve when I values for a compartment fire reaching the enclosure point, the ceiling point, and the room point are plotted on a graph with probability of flame limitation on the ordinate axis (logarithmic scale), with the origin at the top left, and the area of fire involvement on the abscissa axis (linear scale). See "I-Value"

Ignition - Point in the fire growth curve that denotes the beginning of pyrolysis of combustible fuel.

Ign Mode - Ignition Mode. In SAFE one of three ways a compartment can reach EB: orig (as room of origin), therm (due to a thermal (T-bar) failure), or dur (due to a durability (D-bar) failure).

Intermediate Barrier Value (IBV) - The probability that the barrier will be successful in limiting the spread of fire. In SAFE, IBV is calculated as IBV = P(FPC)*P(BF), where P(FPC) is the probability of failure in limiting the fire in the previous compartment (1-Cum L in the previous compartment) and P(BF) is the probability of this barrier failing to limit the fire (1-(T-bar + D-bar)).

I Value (%) - The probability that the fire will self-extinguish at some point between EB and FRI given that the fire was not extinguished by automated systems or by manual firefighting efforts. Each compartment is assigned three I-values: the probability of flame limitation given EB in the room of origin, the probability of flame limitation given EB has occurred in the room as a result of a thermal (T-bar) failure of a barrier, and the probability of flame limitation given EB has occurred in the room as a result of a durability (D-bar) failure of a barrier. In SAFE, these values are abbreviated OI, TI and DI respectively.

L-Curve - A graph which plots the cumulative probability of limiting the flame on the Y axis against time or some other suitable parameter on the X axis such as the number of rooms in a fire path or the deck area of a particular compartment. Convention calls for plotting 0 as the probability of limiting the flame at the top of the Y axis and 100% as the probability of limiting the flame on the X axis. See "cum-L"

L-Value (%) - The probability that a fire will be limited in a given compartment calculated from the I, A, and M values for that compartment.

MAL - Magnitude of Acceptable Loss - The severity of damage that can be tolerated in a compartment. FAL and MAL together establish the FSOs for a given compartment. See "FAL" and "FSOs".

Material ID - A three-character identifier to describe one of a compartment's barriers selected from the catalog of available barrier materials.

M-Curve - The resulting curve when M-values for increasing areas of a compartment are plotted on a graph with probability of flame limitation on the ordinate axis (logarithmic scale) with the origin at the top left and the deck area of the compartment on the abscissa axis (linear scale). See "M-Value".

M Value (%) - The probability that manual firefighting efforts will successfully extinguish the fire before FRI occurs given that the fire did not self-terminate and was not extinguished by automated fire protection systems. Each compartment is assigned three M-values: the probability of flame limitation given EB in the room of origin, the probability of flame limitation given EB has occurred in the room as a result of a thermal (T-bar) failure of a barrier, and the probability of flame limitation given EB has occurred in the room as a result of a durability (D-bar) failure of a barrier. In SAFE, these values are abbreviated OM, TM and DM respectively

NFTI - Naval Firefighting Thermal Imager. A hand-held device used to locate the source of flames in a compartment by sensing the infrared thermal emissions in the space.

Non-Standard Scenario - Similar in all respects to a Standard Scenario except that it considers reduced levels of available fire protection systems.

NSTM - Naval Ship's Technical Manual. A set of regulations and guidelines issued by the U.S. Navy and frequently cited in U.S. Coast Guard regulations.

OBA - Oxygen Breathing Apparatus. A self contained device that supplies oxygen to facilitate firefighting in untenable atmospheres.

One-Shot Halon System - A total flooding system with the capability to completely flood the protected space one time with the required concentration level of Halon 1301.

Overhead - The equivalent in a ship to a ceiling in a building. Overheads can be continuous or stepped, insulated or bare. They can be constructed from steel, aluminum, or a composite material such as nomex or celotex. They can be covered with sheathing, insulation, or both on one side and covered with carpet, tile or a poured floor such as terrazzo on the other. Together with bulkheads, they serve to segment the ship into various compartments.

P-250 - A portable gasoline-powered pump used for firefighting and dewatering.

Passive Fire Protection - Fire protection features designed to limit flame movement by their presence alone. Barriers are the best example of passive fire protection, intumescent coatings, fire doors, fuel load distribution, and insulation of hot surfaces are other examples. See "Active Fire Protection".

Peatross/Beyler Algorithm - The algorithm used in SAFE, version 2.2, to calculate FRI-time for compartment fires. Primary variables include heat release rate, heat loss through the boundaries and the incoming air. See "FRI-Time".

Percent Monitored At Sea (%) - An estimate of the percentage of time around the clock while a ship is underway that a compartment is monitored to detect the presence of smoke and flames. Both personnel and fire/smoke/heat detectors can monitor a compartment.

Percent Monitored In Port (%) - An estimate of the percentage of time around the clock while a ship is in port that a compartment is monitored to detect the presence of smoke and flames. Both personnel and fire/smoke/heat detectors can monitor a compartment.

Petro-Chemicals - One of two classifications of fuel on ships. Petroleum-based chemical products are characterized by having twice the heat energy per pound than cellulosics type of fuel. Examples of petro-chemicals include: flammable liquids and polymeric materials. See "Fuel Load and Cellulosics".

PKP - Potassium Bicarbonate. A dry chemical firefighting agent frequently used in portable fire extinguishers. The only authorized dry chemical portable fire extinguisher permitted on board Coast Guard Cutters.

Plan ID - A unique identifier for compartments as used in the Booklet of General Plans and other ship's drawings. The four fields that make up the identifier are: deck number, forward frame number, relationship to the centerline (1 for starboard, 2 for port, 0 for centerline), and compartment use indicator. Examples are 3-66-0-E, and 01-40-2-L.

Post-FRI Heat Release Rate (kW) - The rate that heat is released from the burning fuel in a compartment during the fully developed fire realm and calculated in accordance with the following expression: $Q = 1500 * A * H^{.5}$ In SAFE, the ventilation factor, $A * H^{.5}$, takes into account the height and area of all ventilation openings. Open doors, hatches, windows, etc. are assumed to be ventilation openings. The numerical coefficient, 1500, assumes stoichiometric burning conditions.

Pre-FRI Heat Release Rate (kW) - The rate that heat is released from the burning fuel in a compartment during the fire growth realm and calculated according to: $Q = Alpha * t^2$. The heat energy produced is used as a key variable in the Peatross/Beyler algorithm for calculating compartment fire temperatures; when the temperature exceeds ambient by 500 degrees Celsius, full room involvement (FRI) is assumed to exist in the compartment.

Pyrolysis - The conversion of solid fuel into flammable vapor through the application of heat.

Qmax - The maximum heat release rate value applied on a compartment-by-compartment basis. Qmax is the upper limit for Q in the Peatross/Beyler algorithm and is a function of the fire growth model. See "Fire Growth Model".

Radiation Point - The transition point between smoldering combustion and the point where a fire grows proportionally to the square of time. This point (beginning of exponential fire growth) is also referred to as Established Burning (EB) since this is the point where radiational feedback to the fuel bed becomes the predominant mode of heat transfer.

Relative Frequency of Acceptable Loss|Fire Free State - Relative Frequency of Acceptable Loss of a compartment given Fire Free State, calculated in SAFE by summing the probabilities of a target compartment or set failing to meet its FSOs over all fire paths, from all possible rooms of origin, multiplied by the frequency of EB in each room of origin.

Residual Heat Transfer (%) - The percentage of remaining thermal energy transferred from a burning compartment to an adjacent compartment due to a D-bar failure of a barrier. This transfer does not occur if the adjacent compartment is at full room involvement. This parameter is a function of the barrier material and can be found in the catalog of available barrier materials.

RLF - Relative Loss Factor - RLFs are calculated in SAFE as a means of assessing whether a target compartment or set meets FSOs. A Relative Loss Factor > 1 indicates that a target compartment has failed to meet its FSOs. This factor is determined by multiplying the target's Relative Frequency of Acceptable Loss given Fire Free State of the target in failures/year (calculated during a given run of SAFE) by the assigned frequency of acceptable loss in years. A target is considered lost if its level of fire involvement in a given path exceeds the level specified by its MAL rating.

Room of Origin - The compartment in a fire path where EB first occurs.

Room Point - The point in the growth of a compartment fire where flames fully involve the compartment. See "Full Room Involvement".

SAFE - Ship Applied Fire Engineering - The computerized implementation of the SFSEM. SAFE is actually an integrated series of computer programs utilizing AutoCAD and the INFORMIX relational database management system

Scenario - A situation defined by the user before executing a SAFE probabilistic model run. Such parameters as run time, ship location, material condition of readiness and firefighting configuration are specified.

SCFP - Small Cutter Fire Protection. Project sponsored by the U.S. Coast Guard to analyze fire safety on cutters less than 180' in length.

SFSEM - The Ship Fire Safety Engineering Methodology. A probabilistic-based risk analysis methodology used to analyze all aspects of the ship's performance in response to a fire compared to pre-established FSOs.

Shell Plating - The ship's hull consisting of the underwater body and the freeboard Main Deck and below. The ship's superstructure is above the Main Deck. Shell plating can be steel or aluminum.

SHIPALT - Ship Alteration. A document that describes an authorized change to the configuration, compartmentation, or other major alteration to a ship. The purpose of SHIPALTS is to standardize the configuration of all ships in a class.

Ship Location - A ship is either "at sea" or "in port" for the purpose of setting up a model run in SAFE.

SOLAS - Safety of Life at Sea. An international convention, prompted by the Titanic disaster (amended several times since), that establishes international regulations for building ships to ensure passenger safety.

Standard Scenario - Scenarios that describe a ship's location and material condition of readiness with passive automated and manual fire protection capabilities in effect. Since this describes a ship under normal operating conditions, these scenarios are referred to as standard scenarios. See "Non-Standard Scenario"

Stepped Deck - That portion of a deck which is not in the same horizontal plane as the majority of the deck.

Stoichiometric - A term that describes ideal burning which assumes there is sufficient oxygen to ensure 100% combustion of available fuel. Stoichiometric burning produces the hottest fire temperatures, therefore sufficient ventilation to produce stoichiometric conditions is assumed in the SFSEM where fire protection systems should be designed for worst case conditions.

Superstructure - The ship's structure above the Main Deck. The superstructure can be steel or aluminum.

T-Adjust (%) - A value that can range from 0 to -99% that is applied to the T-bar value of a specified barrier to account for cracks of other flaws that would reduce it's ability to resist a thermal or hot spot failure. An open door or window is not considered a derating of the barrier.

Target - A compartment or set of compartments which are analyzed in a probabilistic model run for the frequency and magnitude of fire loss due to fires started in every possible room of origin. A target set of compartments may be selected because they contain components necessary to perform a ship's mission. In this manner the likelihood of mission failure can be ascertained.

T-bar (%) - The probability of a thermal failure of a barrier which would permit a small, hot spot ignition in the adjacent compartment.

Therm IAM (%) - The probability of terminating a fire originating in a compartment due to a thermal barrier failure. The probability is calculated from a combination of the I, A, and M curves for that room. If the room is a room of origin, Therm IAM is not applicable.

Two-Shot Halon System - A total flooding system with the capability to completely flood the protected space two times with the required concentration level of Halon 1301. This system is designed such that each shot of Halon is released from a different location in the vessel.

USCGC - United States Coast Guard Cutter

Vent Area (sq in) - The sum of all the ventilation openings in a compartment, excluding doors and hatches but including ventilation grates in a door. Used to calculate the post-FRI heat release rate. See "Post-FRI Heat Release Rate".

Vent Height (in) - The average of the vertical height of all vent openings in a compartment. The height of the compartment itself is used for horizontal vents.

Ventilation Controlled Burning - When insufficient ventilation is available, ventilation controlled burning occurs. The fire is limited by the air supply available for combustion. See "Fuel Controlled Burning".

Ventilation Factor - A factor, $A*H^{0.5}$, that describes the primary variables in the post-FRI heat release rate calculation in SAFE. These variables are the area and height of the ventilation opening(s) in a compartment. In compartments with multiple vents, areas are summed and heights are averaged.

WMEC - U. S. Coast Guard Medium Endurance Cutter.

XRAY, YOKE and ZEBRA - Material Conditions of Readiness. Successively increasing levels of watertight integrity for controlling damage. At each level, additional access closures, valves and fittings are required to be closed to limit fire and flooding.

Zero-Strength Barrier - An imaginary boundary used to model extremely long passageways and multiple deck compartments. The barrier is presumed to have no thermal resistance.

1. INTRODUCTION

1.1. BACKGROUND

The U.S. Coast Guard operates a large fleet of medium endurance cutters to conduct various Coast Guard missions including Search and Rescue, Maritime Law Enforcement, and Defense Operations. The fleet includes 33 cutters primarily in the 210' and 270' WMEC Medium Endurance Cutter classes. These cutters are equipped with flight decks, JP-5 refueling machinery and other equipment to support helicopter operations. Typical patrols may extend up to three weeks underway, although two week patrols are more common. The crew size on the 270' WMEC is 100 persons; this class of cutter is considered to be minimally manned and shore support is provided to augment maintenance activities in port.

The Coast Guard initiated the Small Cutter Fire Protection (SCFP) project to thoroughly analyze the fire safety of ten classes of small cutters (less than 180' in length) and produce a tailored fire protection doctrine for each small cutter. The scope of the SCFP project included the 82' Point Class Patrol Boat, 110' Surface Effect Ship, 110' Island Class Patrol Boat, 65' Harbor Tugboat, and several classes of buoy tenders (including the 175' WLM (R) class) in the Coast Guard fleet. The Fire Safety Analysis of Cutters (FSAC) project was initiated by the Coast Guard to thoroughly analyze the fire safety of large cutters. The scope of the FSAC project includes cutters 180' and greater, such as the 180' Seagoing Buoy Tender, 210' and 270' Medium Endurance Cutters.

The technical approach in the SCFP and FSAC projects specifies the use of the Ship Fire Safety Engineering Method (SFSEM) as the analytical tool to evaluate shipboard fire safety. The SFSEM is a probabilistic-based risk analysis methodology which provides an integrated framework to account for all relevant aspects of shipboard fire protection. The Theoretical Basis of the SFSEM provides a comprehensive discussion of the SFSEM. [1] The SFSEM is designed to evaluate the ship's performance compared to pre-established fire safety objectives (FSO). The methodology quantifies the contribution of passive and active fire protection systems, thus it provides a means for analyzing and comparing hypothetical design alternatives to improve the overall fire protection on the cutter as necessary. SAFE, version 2.2, is a series of integrated computer programs which automate the numerous calculations required. In addition, various output options are available in SAFE that permit a detailed analysis of compartment and barrier performance. Appropriate documentation is available in the SAFE User Manual, version 2.2. [2]

As noted in the final report for the SCFP project, the following features of the SFSEM have been clearly demonstrated: [3]

- utility to analyze existing ships, as well as proposed designs
- ability to identify problem compartments which fail to meet fire safety objectives
- capability to analyze the effectiveness of hypothetical design alternatives

Therefore, the SFSEM was again specified as the analytical tool to evaluate the fire safety of the 270' WMEC Medium Endurance Cutter in the FSAC project.

1.2. SCOPE

The scope of this project is limited to analyzing the fire safety of the 270' WMEC Medium Endurance Cutter class. The first four cutters in the 270' WMEC class were built by Tacoma Boat Shipyard in Tacoma, WA and comprise the A-class. The last nine cutters in the class were built by Robert E Derecktor Shipyard, Middletown, RI and comprise the B-class. Even though all cutters were built according to the same plans and specifications, differences in the interpretation of the performance specifications by the two shipyards resulted in minor differences in these two sub-classes. These differences are not considered significant enough to affect the results of a fire safety analysis, however verification of this was outside the scope of this report. The CGC SPENCER (WMEC 905) was selected by the Coast Guard as representative of the 270' WMEC class, thus this ship was used as the basis for this study.

A complete fire safety analysis would optimally include a detailed study of flame movement, smoke movement, people movement, and an analysis of the structural ability of the vessel to withstand fire. Since the SFSEM was specified for use as the analytical tool to evaluate fire safety, a quantitative analysis of flame movement is feasible, however the smoke movement, people movement, and structural analysis modules have not yet been developed and integrated into the methodology. Therefore, to the extent possible, qualitative analyses of these additional aspects of fire safety have been provided in this study.

1.3. OBJECTIVES

The primary objective established for this project is to thoroughly evaluate the fire safety design of the 270' WMEC. In this context, "fire safety design" includes the compartmentation, outfitting and construction materials, fire detection and suppression systems, fixed and portable firefighting equipment, and any other aspect of the vessel that pertains to fire safety. This analysis was based on information collected during a ship visit to the CGC SPENCER in July 1996. The 270' WMEC was studied in its normal operating configuration, in port and at sea, with a full complement of outfit and crew. It is assumed that the ship is intact, and not subject to fires resulting from enemy action or arson. The "at sea" fire scenarios assume that the full crew complement of 100 persons are on board, awake, and alert and that two repair parties are fully manned with 13-15 crew members each. The "in port" fire scenarios are assumed to occur at night when the normal duty section is on board. In addition, some other crew members not in the duty section may also be on board at night in port. The normal in-port duty section is assumed capable of manning one repair party with the same number of crew members as at-sea conditions (13-15 persons).

1.4. TECHNICAL APPROACH

This project was organized into five sequential phases:

1. Conduct a ship visit of the CGC SPENCER, Boston, MA.
2. Document factual input data and develop subjective input data.
3. Perform baseline fire safety analysis using the SFSEM/SAFE.
4. Analyze alternatives using the SFSEM/SAFE.

5. Prepare final report.

The first phase included a ship visit on July 22-24, 1996. During this visit various documentation was collected such as the ship's compartment check-off lists, damage control book, and machinery space firefighting doctrine. This documentation provides valuable information concerning the location of installed and portable fire protection equipment, damage control classifications of closures such as doors and windows, and manual firefighting procedures in port and at sea. This phase also included modeling the compartmentation in AutoCAD as a necessary prerequisite for using the SFSEM and it's related computer programs, SAFE, which implement the Method. The second phase involved developing subjective input data such as probabilities of flame termination and documenting the factual input data such as fuel loads and ventilation details. After all input data was entered into SAFE, a thorough review of the baseline fire safety levels of the 270' WMEC using the SFSEM/SAFE was performed in phase three. All available SAFE output options were used to thoroughly evaluate compartment and barrier performance. The individual target option provided relative loss factors which are a relative comparison of compartment loss compared to the fire safety objectives established for each compartment. The barrier option helped to identify probable rooms of origin which cause multiple room fire paths. The path option provided the data which identifies the most probable fire paths from selected rooms of origin. Phase four included analyzing alternatives such as the impact on baseline fire protection levels of various automated fire protection systems installed in the Engine Room or the Auxiliary Machinery Spaces and replacing the existing non-continuous joiner bulkheads installed in compartments on the Second Deck and above with joiner bulkheads which are continuous to the deck above. Finally, the results of the entire study were documented in the final technical report compiled in phase five.

1.5. FIRE SAFETY ANALYSIS PROCEDURE

The fire safety analysis of the 270' WMEC was conducted in two major steps:

- Fire Safety Audit. The five phases in the life cycle of a fire were examined during the fire safety audit. These phases include prevention, detection, containment, extinguishment and post-extinguishment. Information and documentation were also collected to identify and determine the input data needed to run SAFE.
- Detailed Fire Safety Analysis using SFSEM/SAFE. The SFSEM/ SAFE was used to perform a detailed fire safety analysis of existing "baseline" fire protection levels.

The following sections will address the various aspects of these two steps which are used to analyze fire safety on the 270' WMEC.

1.5.1. FIRE SAFETY AUDIT

Information required to conduct the fire safety audit is collected during the ship visit. If a ship visit is not feasible, this information is obtained from ship's drawings and other written documentation that may be available. The fire safety audit is conducted to identify existing passive and active fire protection features and procedures, determine fuel loads and any unusual fire hazards, and to evaluate the accessibility of compartments for firefighting and egress routes for personnel. When possible, a fire drill is observed to assess the characteristic time it takes to

set ZEBRA and to enable the analyst to assess manual firefighting effectiveness. The cutter's Machinery Space Firefighting Doctrine, Casualty Control Manual, Compartment Check-off Lists, Repair Locker Inventory and other critical information regarding the cutter's firefighting procedures are collected and reviewed if they are available. The results of this review are organized according to the phases in the life cycle of a fire commencing with prevention, and proceeding through detection, containment, extinguishment, and post-extinguishment. The objectives of these five phases are briefly discussed in the following sections.

1.5.1.1. Prevention

The four basic principles of fire prevention which should be observed routinely to reduce the incidence of shipboard fires are:

1. Frequent inspections
2. Proper stowage of combustibles (housekeeping)
3. Training and education
4. Enforcement of fire prevention policies and practices such as good housekeeping

The fire prevention phase also includes first aid or the initial attempts to extinguish a fire after ignition occurs but before the fire grows substantially beyond the point described as established burning (EB). The 270' WMEC was examined for adherence to the four principles described above and to identify procedures and equipment the ship routinely uses for first aid.

1.5.1.2. Detection

There are two ways a fire can be detected on board ship - by a crew member or by an installed monitoring device. Coast Guard cutters are typically equipped with heat and/or smoke detectors in berthing areas, engineering spaces, offices, storerooms and other areas where early warning of fires is deemed beneficial. In some Coast Guard cutters, these detectors are wired to a central alarm panel installed on the Bridge and a slave panel installed on the quarterdeck and sometimes in the Engineering Control Center. If the cutter has a large number of compartments, several compartments are usually tied together into a common zone on the alarm panel. The disadvantage to this method is that further investigation is required to determine which compartment in the zone contains the actual fire. On some other cutters, the detectors are not wired to a central alarm panel; typically these are battery powered and sound an alarm only in the space where the fire is detected. The design of the detection system, the type and sensitivity of the detectors installed, the location of detectors, and the reliability of the system are some of the factors considered in determining the probability of detection; thus the details concerning the installed detection system are carefully studied during the fire safety analysis.

1.5.1.3. Containment

It is desirable to contain the fire within the room of origin to minimize the damage throughout the vessel. Containment of a fire can be accomplished through passive and/or active means. Passive measures include adequacy of compartmentation, use of non-combustible construction materials, and control of quantity, type and distribution of fuel loads. Active measures include setting condition ZEBRA, and securing ventilation, fuel and electrical power in

the affected spaces. All bulkheads and decks which serve as barriers to contain a fire are studied to determine their adequacy for this purpose. The location of isolation valves, remote shutdowns, and fire dampers are also determined and considered in the fire safety analysis.

1.5.1.4. Extinguishment

Extinguishment requires appropriate firefighting equipment in strategic locations, adequate protective equipment and clothing for firefighters, and personnel adequately trained to operate the equipment and work as a team. Firefighting equipment includes both manually operated and automatic/automated systems. Protective equipment and clothing include emergency escape breathing devices, oxygen breathing apparatuses (OBA), firefighting ensembles, flash gear, etc., and hand held detection devices such as a firefinder or the naval firefighting thermal imager (NFTI). The location, type, size, and number of firefighting equipment is studied to determine its adequacy for the typical hazards noted during the ship visit.

1.5.1.5. Post-Extinguishment

Post-extinguishment activities include desmoking, reinstating a safe and healthy atmosphere in affected compartments, and restoring ship's vital systems such as weapons systems, navigation, propulsion, and electrical generating equipment. Thus red devil blowers, atmospheric testing gear, casualty power cables, and so forth are examined to determine if the crew has adequate equipment to rapidly restore vital systems following a fire incident.

1.5.2. DETAILED FIRE SAFETY ANALYSIS

A nine step procedure for conducting a detailed fire safety analysis using the SFSEM/SAFE has been developed and refined over the course of conducting previous similar analyses. Prior to conducting the analysis, it is necessary to convert the ship's general arrangement drawings to an AutoCAD rendition. Once the ship has been modeled in AutoCAD, the following procedure is used to perform a detailed fire safety analysis:

1. Load Database with Ship's Geometry
2. Conduct Ship Visit
3. Load SAFE Input Values
4. Calculate FRI Times and Post-FRI Heat Release Rates
5. Run Probabilistic Model
6. Analyze Baseline Results
7. Analyze Alternatives
8. Conduct Cost-Benefit Analysis
9. Document Results

These steps are discussed briefly in the following sections.

1.5.2.1. Load Database with Ship's Geometry

The simple, yet accurate, representation of the ship's geometry created in AutoCAD is utilized by the connectivity generator in SAFE to produce a listing of all compartments on the ship. Also produced is a listing of each compartment's barriers and individual connections to other compartments or to the weather. Once these lists have been verified for accuracy, they are loaded into SAFE's database and ship visit forms are produced.

1.5.2.2. Conduct Ship Visit

The SFSEM/SAFE requires an extensive amount of data to facilitate an analysis of the cutter's fire safety. Preprinted ship visit forms ensure the information concerning fuel loads, compartmentation, ventilation, fire safety objectives (FSOs) and other required data is collected in an efficient manner. This information is also used by the engineer/analyst to temper the engineering judgment required to develop the probabilistic values entered into SAFE. The quality of the fire safety analysis is directly proportional to the quality and completeness of the information collected during the ship visit and from written documentation, drawings, and other information sources.

1.5.2.3. Load SAFE Input Values

This step includes refining the ship's geometry with any new information gathered during the ship visit, determining all required fire parameters, performing the data entry of the information on the ship visit forms and verifying the accuracy of the entered data. The values now in the database comprise the "baseline data set" for the ship. This baseline data set permits discrimination from data associated with hypothetical alternatives that may be analyzed later in the analysis.

1.5.2.4. Calculate FRI Times And Post-FRI Heat Release Rates

Flashover is the sudden propagation of flames through the unburned gases and vapors collected at the top of the compartment. Flashover invariably leads to full room involvement (FRI) conditions where the majority of combustible surfaces are burning and conditions for life are untenable without self-contained breathing devices and thermal protective clothing. FRI time, or the elapsed time from EB to Full Room Involvement (FRI), is a very important parameter in fire growth. After all input values have been assigned, FRI times and post-FRI heat release rates are calculated for each compartment. FRI times may be reviewed and adjusted, or input values used to calculate FRI time may be adjusted and FRI time recalculated. FRI times are calculated in SAFE in accordance with the Peatross/Beyler algorithm. [4] Basically, this algorithm calculates the time in minutes for the temperature in a compartment to rise 500 degrees Celsius above ambient.

The variables in the post-FRI heat release rate calculation are included in the ventilation factor: $A*H^{0.5}$. This factor takes into account the height and area of a single vertical ventilation opening which is providing natural (unforced) ventilation. The coefficient for this variable is based on the worst-case assumption of stoichiometric combustion. Some ship compartments are served by multiple vents and frequently use forced ventilation through horizontal vents; thus,

determining vent opening height becomes problematic. The Theoretical Basis of the SFSEM provides an explanation how SAFE deals with multiple and horizontal vent openings. [1]

1.5.2.5. Run Probabilistic Model

Once the database has been loaded with all required input, the probabilistic model is run on the baseline data set to establish the baseline fire safety levels of the ship. Several parameters have to be specified in order to run the model. These parameters are specified in "scenarios" and include: material condition of readiness (XRAY or YOKE), ship location (in port or at sea), firefighting configuration (passive (I), automated (A), and/or manual (M)), simulation run time (in minutes), and barrier failure criteria (best case or worst case). The Theoretical Basis of the SFSEM and SAFE User Manual, version 2.2, provide detailed explanations for these parameters and scenarios. [1, 2]

1.5.2.6. Analyze Baseline Results

The objective of the detailed fire safety analysis is to quantify the level of fire safety associated with the existing ship. To facilitate discussion, this result is referred to as the "baseline". Baseline Data Sets reflect input values to the SAFE program which are based on the physical condition of the ship and not influenced by any modifications or alterations which may be proposed as a result of this analysis.

The baseline analysis is designed to identify compartments which fail to meet FSOs (or significantly exceed their FSOs) so that attention can be focused on these compartments. Ideally, multiple hypothetical alternatives can be identified and studied to improve the fire safety to minimally acceptable levels where appropriate. A cost-benefit analysis may then be conducted to form the basis for recommendations.

The results of using the individual target option with the standard scenarios on the baseline data set are carefully examined to determine how well the ship performs as a fire safety system in response to a fire. This is accomplished by examining relative loss factors (RLF) for "target" compartments. RLFs greater than 1.0 indicate the target compartment failed to meet the FSOs established for that compartment and an improvement in fire protection is needed. A target compartment with a RLF equal to 1.0 indicates the compartment exactly meets its FSOs. A target with a RLF less than 1.0 indicates the compartment exceeds its FSOs and a reduction in fire protection may be acceptable.

Note that the results from the individual target option focus on the target compartments which do not meet their FSOs, they do not provide any insight as to the primary sources of the fires that ultimately caused the loss of the targets. Determining the source, or cause for each failed compartment may involve running the probabilistic model with different output options such as the barrier or path options. For example, the detailed reports from the target option, barrier option, and path option may yield information that many of the fire paths that ultimately involve the target compartment actually originate in another compartment. Thus improving the fire protection in the appropriate room of origin may improve the results in the target compartment as well as the room of origin.

1.5.2.7. Analyze Alternatives

To determine ways to improve the fire safety of compartments which fail to meet FSOs, or less typically, to determine ways to reduce fire safety in over-protected compartments, hypothetical alternatives may be efficiently analyzed using the SFSEM/SAFE. An alternative data set modifies the parameters of the baseline data set such that it represents the conditions that would be in effect if that alternative reflected actual conditions on the cutter.

This step usually involves analyzing alternatives to identify improvements in compartments which fail to achieve FSOs. In those cases where the baseline fire safety levels exceed FSOs in all compartments for all scenarios, no improvements would be necessary. In these cases this step can still serve a useful purpose. For example, certain features of the existing fire safety design may be hypothetically removed so that the effect on fire safety can be demonstrated and perhaps justify a recommendation to eliminate "over-protection". Other "alternatives" that may be studied include certain fire safety features that would achieve the sponsor's objectives. For example, the sponsor may want to study the effect of one parameter on fire safety or an equivalent firefighting agent, even though acceptable FSOs are being achieved.

1.5.2.8. Conduct Cost-Benefit Analysis

If multiple alternatives are identified, a cost-benefit analysis may be conducted to recommend the most cost effective alternative. Moreover, a weight-benefit or volume-benefit analysis may be substituted for the cost-benefit analysis depending on the sponsor's objectives. In either event, the "benefit" is quantified by the improvement in the RLFs. The "cost" should take into account the direct and indirect costs of implementing the change. Weight, volume, and price are examples of direct costs while inconvenience to the crew, effects on the environment, or impact on other missions are examples of indirect costs.

1.5.2.9. Document Results

The final report documents the results of the baseline analysis and consideration of all alternatives. Reports from SAFE that were generated are included as appendices to provide supporting data. Graphic reports from SAFE (including color-graphics) may significantly enhance the report. For example SAFE can generate deck plans which portray compartments which fail to meet FSOs in red, while compartments colored yellow, green or blue are progressively "safer".

1.6. ORGANIZATION OF REPORT

Section 2 of this report discusses historical fire records that pertain to U. S. Coast Guard cutters as well as the process used to establish the frequency of EB in various types of compartments. The results of the fire safety audit and the baseline fire safety analysis of the 270' WMEC are discussed in section 3. Results from the various output options identify certain compartments which are more likely to be rooms of origin than other compartments in the ship. Consequently a discussion is included in section 3 concerning probable fire paths from these rooms of origin. Section 4 presents the results of the analysis of alternatives phase of the project. In this section the analysis of the non-continuous joiner bulkheads installed on the Second Deck and above is discussed. The results of the analysis of various automated fire protection systems

installed in the Engine Room and the Auxiliary Machinery Spaces are also included in this section. Section 5 summarizes the conclusions and recommendations that were developed as a result of the fire safety analysis accomplished in this project. Appendix A includes plan views of all decks in the 270' WMEC Medium Endurance Cutter (B-Class). Appendix B includes the documentation of all input data that comprises the baseline data set. Appendix C contains the detailed baseline fire safety analysis results generated by running the individual target option as well as the barrier option and the path option on selected rooms of origin. Appendix D contains the target option output results from the analysis of alternatives phase of the project.

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2. HISTORICAL RECORDS OF FIRE

2.1. FREQUENCY OF ESTABLISHED BURNING

Fire safety analyses of Coast Guard Cutters to date have utilized historical records to establish the frequency of established burning (EB) since adequate data from the U.S. Naval Safety Center and U.S. Coast Guard Headquarters is available for each type of compartment aboard a cutter. Military ships, including Coast Guard Cutters, are required to report all fires that result in damage or personal injury. This provides the opportunity to utilize historical records to determine the frequency of EB.

Historical reports of fires on all classes of Coast Guard Cutters were obtained from the Commandant (G-KSE-4), U.S. Coast Guard, for the period FY87-FY91. This data was combined with data received from the U.S. Naval Safety Center on 21 classes of large naval vessels during the period 1975 through 1986 to refine the reported fire frequencies. For the purposes of the SFSEM, similar compartments were grouped by compartment use indicator (CUI). CUI categories were adapted from the standard nomenclature used by the Coast Guard and Navy to identify compartment usage. Some CUIs were further subdivided in order to permit a more accurate assignment of reported fire frequency. Based on experience, it is estimated that approximately half of all fires which reach EB do little or no damage to the vessel and result in no injuries to personnel; thus they may go unreported. As a result, the "reported frequency of EB" based on historical data is doubled and called "adjusted fire frequency" to account for unreported fires. The number of fires reported and adjusted fire frequency values from the combined Navy and Coast Guard data is shown in Table 2.1 grouped according to CUI.

Note that the Main Propulsion Mechanical (EM) and Emergency Auxiliary Generator Rooms (QE) exhibit adjusted fire frequencies which are orders of magnitude greater than other compartments. This fact has a substantial impact on the results of a fire safety analysis using the SFSEM.

Table 2.1 Fire Frequency Data

Type of Compartment	Compartment Use Indicator (CUI)	Number of Fires Reported	Adjusted Fire Frequency (1) (Fires per Compt Year)
Cargo Hold	AA	0 (2)	0.0001 (3)
Gear Locker	AG	19	0.0010
Refrigerated Storage	AR	3	0.0009
Storeroom	AS	34	0.0009
Ship Control Area	C	4	0.0012
Main Propulsion Electrical (4)	EE	7	0.0031
Main Propulsion Mechanical	EM	148	0.0272
Fuel Oil, Lube Oil Tank	F	0 (2)	0.0001 (3)
JP-5 Fuel Tank	J	0 (2)	0.0001 (3)
Hazardous Material Storage	K	4	0.0013
Berthing Space	L1, L2, L5	20	0.0008
Wardroom, Mess, Lounge Space	LL	7	0.0008
Medical, Dental Space (4)	LM	0	0.0001
Passageway, Staircase, Vestibule	LP	3	0.0001
Sanitary Space	LW	4	0.0002
Explosives Storage	M	1	0.0001
Auxiliary Machine Space (4)	QA	89	0.0029
Emergency Aux. Generator Room (4)	QE	23	0.0204
Fan Room	QF	7	0.0004
Galley Pantry, Scullery	QG	13	0.0026
Helicopter Hangar	QH	3	0.0036
Laundry	QL	5	0.0031
Office Space (4)	QO	5	0.0004
Shops, Labs	QS	15	0.0018
Trunk, Hoist, Dumbwaiter	TH	0 (2)	0.0001
Stack, Uptake	TU	5	0.0013
Void, Cofferdam	V	1	0.0001 (3)
Water, Peak, Ballast Tank	W	1 (2)	0.0004

NOTES:

1. Taken as twice the reported fire frequency
2. Based on 1986 - 1991 USCG data only. (All other numbers of fires based on both USN and USCG data.)
3. Default value used in cases where no fires have been reported, or when calculated adjusted frequency is below 0.00005
4. New compartment types added since analysis of first three small cutters in the SCFP project.

2.2. HISTORICAL RECORDS OF FIRES ON COAST GUARD CUTTERS

The Coast Guard MISREP database was researched for historical records of reported fires by all Coast Guard Cutters during the period FY87 through FY91. Commandant (G-KSE-4) data included reports of 29 fires and 2 explosions over the five year period on cutters that represent 95% of the Coast Guard fleet. Three of the 31 fires/explosions (10%) occurred in 378' High Endurance Cutters; 13 fires/explosions (42%) occurred in 270' and 270' Medium Endurance Cutters, 180' Medium Endurance Cutters, and 140' Icebreaking Tugboats; the remaining 15 (48%) occurred in small cutters ranging from 65' Harbor Tugboats to 110' Island Class Patrol Boats, and Construction Tenders.

The data provided by the Commandant (G-KSE-4) was also analyzed to obtain information such as the frequency that arson is a problem, the frequency of fires that spread to other compartments from the room of origin, the class of fires that most frequently occur, the type of compartment where high dollar loss fires occur, etc. This analysis revealed the following:

- The breakdown of the 29 fires show that 18 were class A, 4 were class B, 5 were class C and there were 2 unknown class fires.
- Most reported fires were relatively minor. Only 7 fires resulted in damage exceeding $1,000. There were no deaths, 6 minor injuries, and 25 fires with no injuries.
- Arson was not considered a factor in any reported fire.
- Most reported fires were quickly extinguished by the crew (90% within five minutes). Only three reported fires took longer than five minutes to extinguish. 93% of all reported fires were contained within the room of origin.
- Additional mishap data provided by Commandant (G-KSE-4) shows that the majority of high dollar loss fires originate in Engine Rooms.
- 42% of the fires occurred in port, 29% underway, 23% during a Yard period, and 6% unknown. Note the period of time a vessel was undergoing FRAM, SLEP or MMA was excluded.

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3. FIRE SAFETY ANALYSIS OF THE 270' WMEC

The objective of this project is to evaluate the fire safety of the 270' WMEC Medium Endurance Cutter class. The basic technical approach includes an analysis of the cutter's fire protection compared to it's fire safety objectives using the Ship Fire Safety Engineering Method (SFSEM) as the computer-based analytical tool. This section of the report will discuss the results of the fire safety audit and the detailed fire safety analyses of the 270' WMEC using the SFSEM.

The following sections of this report will address the specific fire safety analysis results organized as follows:

- Fire Safety Audit. A fire safety audit is performed in conjunction with the ship visit to the CGC SPENCER and a review of their drawings and pertinent documentation available to the analysis team.
- SAFE Input Data. The sources for the factual and subjective input data needed to run SAFE are documented in this section.
- Baseline Fire Safety Analysis. The SFSEM/SAFE is used to perform the fire safety analysis based on the baseline data set populated with data determined from the ship visit, ship's drawings, compartment check-off lists, SPENCER's Damage Control Book and Machinery Space Firefighting Doctrine.

3.1. FIRE SAFETY AUDIT

The fire safety audit of the 270' WMEC is based on a review of the following documentation and other information relevant to the fire safety design of the cutter:

- 270' WMEC (B-Class) Drawings, provided by the U.S. Coast Guard (see Appendix A to this report)
- CGC SPENCER INSTRUCTION M9664, Machinery Space Fire Doctrine, dated May 1, 1996 [5]
- CGC SPENCER Compartment Check-Off Lists
- CGC SPENCER Damage Control Book [6]
- Report of the CGC SPENCER Ship Visit on July 22-24, 1996 dated July 31, 1996 [7]

The results of the fire safety audit are presented in the following sections organized according to the life cycle stages of a fire incident that starts with prevention and evolves through detection, containment, extinguishment, and post-extinguishment.

3.1.1. PREVENTION

The following conditions were noted that directly affect this cutter's ability to successfully prevent a fire:

- It is evident that the crew displays pride in their ship and they maintain the vessel in a remarkably clean and neat condition. For example, no buildup of grease or oil was noted in

the bilges or on the machinery in the engineering spaces. Good housekeeping practices are a major factor in preventing unwanted ignitions.

- Two 5-gallon cans of gasoline were found in the JP-5 Refueling Station (1-207-3-J). Discussions with the crew revealed that this is not a normal condition. For the purposes of this analysis, it is assumed that gasoline is stored only in designated gasoline storage areas on the fantail and in designated locations for portable pumps. Other than these exceptions, on-board stowage of flammable liquids is limited to the Flammable Liquids Storeroom (1-5-0-K). This compartment is equipped with a rate-of-rise heat detector and associated automated CO_2 total flooding fire extinguishing system.
- Smoking is not permitted anywhere inside the ship. The designated smoking area is the weather deck in the vicinity of the fantail. The gasoline storage area is also on the fantail. Changing the designated smoking area to a location on the weather decks well away from gasoline storage areas, pyrotechnics, and ready service ammunition should be considered by the Commanding Officer.
- The type, location, and quantity of portable fire extinguishers installed is shown in Table B.5 in Appendix B. The types of extinguishers installed and their location are considered appropriate to deal with the anticipated fire threat.

The compartmentation was reviewed to determine if adequate means of egress exist for crew members to escape from a fire and to assess the ability of the crew to access each compartment for the purpose of firefighting. The existing compartmentation appears to be adequate to permit egress from all normally occupied spaces with the exception of the Ordnance Workshop (2-40-1-Q). The "normal" egress from this space is via the escape scuttle into the 76 mm Magazine (1-26-0-M). The normal means of egress is designed to be the watertight door between the Ordnance Workshop and the Passageway (2-28-2-L). However since this door is normally locked with a high security lock on the Passageway side of the door, it is not used as the primary means of egress. Moreover it is likely that the door could not be used in an emergency by personnel trapped in the Ordnance Workshop since the door cannot be unlocked from the Ordnance Workshop. Since the Ordnance Workshop is frequently occupied, it would be desirable to have a second means of egress in the event a fire in the Passageway (2-28-2-L) or 76 mm Magazine (1-26-0-M) blocks one egress path. Reconfiguring the lock on this door to permit a normal and alternate means of egress from the Ordnance Workshop, both of which are usable at all times, is considered an important life safety issue and is highly recommended.

3.1.2. DETECTION

As shown in Table B.4 in Appendix B, ionization type smoke detectors are installed in various compartments throughout the ship. In addition, heat detectors are installed in the IC Room (2-47-1-C) and a rate-of-rise heat detector is installed in the Flammable Liquids Storeroom (1-5-0-K). Heat detectors are also installed in the 76 mm Magazine (1-26-0-M), Small Arms Magazine (2-214-2-M) and Helicopter Hangar (01-117-0-Q); these detectors are not shown in Table B.4 because these spaces are not considered in the fire safety analysis as explained in section 3.2.2.2 of this report. The detectors are installed in 16 zones throughout the ship, therefore the detection system is not considered to be fully addressable. Such a system would indicate the compartment number (or name) instead of the zone that is responsible for the

alarm. The detectors activate an audible and visual alarm on the fire detection panel located in the Engineering Control Center (3-152-0-E). An audible alarm is also activated on the alarm panels located in Vestibule (01-47-1-L) and Vestibule (1-207-1-L). Since the detection system is not fully addressable, an investigation must be made to ascertain which compartment is signaling the alarm if the zone represents multiple compartments.

During the ship visit an attempt was made to locate all installed detectors and determine their operability. The detector in the Sensor Room and Command Support Center (02-63-0-C) could not be found. The ship's electricians stated "there are no detectors in this compartment". However, the ship's Damage Control Book on page IV(b) 5 and IV(b) 7 states that detectors protecting this space are located in recirc. vent. ducts 02-117-2 & 02-117-1. According to the Damage Control Book detectors protecting several other spaces are also located in ductwork. Since the ship's electricians are apparently unaware of the exact location of all detectors, it is likely that some detectors are not being systematically inspected and maintained. Therefore some detectors may be inoperative since the ship is over ten years old.

Based on observations and discussions with the SPENCER crew, it appears that the existing detection system is responsible for frequent false alarms. Failure to believe an actual alarm was partially accountable for a delay in locating a fire that occurred in the Electronic Equipment Space and Storeroom (01-116-0-Q) in February 1994. This costly fire also revealed a problem with compartment names. For example Zone 16 is labeled "Electronic Equipment Space and Storeroom". When the visual and audible alarms indicating Zone 16 at 2230 the night of February 11, 1994 while the ship was in port, the crew did not immediately associate the alarm with the space they commonly referred to as "ET Stores". This fire was the subject of an extensive investigation and many lessons learned. It would be beneficial for other ships in the 270' WMEC class in particular and the Coast Guard fleet in general to be made aware of lessons learned from all Coast Guard cutter fire investigations.

The input values for the percent time monitored for each compartment are based on the estimated time around the clock a compartment is monitored by persons in the crew or by an automatic detector. The normal value of 95% for percent time monitored in compartments protected by automatic detectors was reduced for this analysis in certain compartments to reflect the fact that the existing detection system is not fully addressable. Crew notification of the fire is one of several factors considered in the calculation of the probabilities of automated and manual flame termination. The presence of automatic detectors increases the probability that the crew will be notified of a fire while the fire is still small. Table B.4 in Appendix B lists the location, zone, quantity, and type of detectors installed in each compartment; in addition the percent time monitored established for each compartment is shown as well as the estimated minutes to detection. This estimate is a function of the percent time monitored for each compartment as described in Chapter V, sections H.1 and H.2, of the SAFE User Manual [2].

3.1.3. CONTAINMENT

A very effective means for containing the fire to the room of origin is the inherent ability of non-combustible compartment boundaries to resist the spread of fire and smoke. Open doors quickly compromise the ability of compartmentation to contain fire or smoke. Therefore it is assumed that open joiner doors as well as watertight doors and hatches labeled XRAY, YOKE,

and ZEBRA are closed in a timely manner when condition ZEBRA is set in response to a fire. In addition, securing ventilation is an extremely important factor in containing fire and smoke. The ship's Machinery Space Firefighting Doctrine describes the ship's procedures for controlling ventilation to limit the spread of smoke [5]. The damage control classification of doors and hatches was noted during the ship visit and is documented in the ship's compartment check-off lists. The classifications (shown in Appendix B, Table B.2) are considered in accordance with NSTM 079. [8].

Numerous compartments on the Second Deck, Main Deck and 01 Level contain joiner bulkheads which terminate at the height of the dropped ceiling and are not continuous to the deck above. The dropped ceiling consists of light plastic panels installed in a framework; some of which have a thin layer of fiberglass insulation attached. Ideally the 1' to 2' interstitial spaces created above the dropped ceiling and below the deck above is modeled in SAFE as an additional deck level (or "layer" in SAFE terms). This allows the spread of fire through the thermally weak dropped ceiling to be realistically modeled. Modeling the 270' WMEC in this manner however, exceeds the maximum number of layers that can be handled in SAFE. Therefore for the baseline analysis, the thermal strength of the non-continuous joiner bulkheads are derated 90% to simulate the ease that fire would spread from one compartment to another through the common interstitial space above the two compartments. Section 4.0 of this report describes the results from analyzing the impact of non-continuous joiner bulkheads by eliminating this derating. In essence this models the compartments as if the joiner bulkheads were continuous to the deck above. Comparing the results from this study with the baseline results provides a quantifiable assessment of the impact of non-continuous joiner bulkheads on overall fire safety levels of the cutter.

Due to the permanent removal of doors, the Crews Mess, Scullery, and Galley are essentially one large compartment for the purposes of fire and smoke movement. This situation prevents isolating the fire to the room of origin and will facilitate the rapid transport of smoke and flames between these spaces. It is suspected that removing these doors is an unauthorized SHIPALT, thus it may be unique to SPENCER and not be a class-wide problem.

3.1.4. EXTINGUISHMENT

The following firefighting systems and equipment are installed in the 270' WMEC:

- The firemain system is supplied by two electric fire pumps rated at 500 gpm each; one is located in the Auxiliary Machinery Space #2 (3-82-0-E) and the other is in the JP-5 Pump Room (4-186-0-J). The firemain and fire stations are designed such that any part of the 270' WMEC can be reached from at least two fire stations with a single 50' length of fire hose. The 6-inch firemain is supplied from 5-inch risers and provides salt water at 125 psi to firemain stations (hoselines), the fire monitor on the 01 weather deck, the AFFF firefighting system, the washdown countermeasure system, and the magazine sprinkling system.
- Three P-250 portable fire pumps are available for firefighting and dewatering. Two droppable pump kits are located on the 01 level; these pumps are primarily intended for rescue and assistance and are not intended for use in SPENCER.

- A manually operated deck-gun type, 1000 gpm water monitor is installed on the 01 weather deck and is intended for off-ship firefighting.
- A fixed CO_2 total flooding system is installed in the Flammable Liquids Storeroom and in the JP-5 Pump Room.
- An aqueous potassium carbonate firefighting system is installed to extinguish grease fires in the Galley.
- Two fireplugs are designated firefighting foam stations for combating class B flammable liquid fires. The two stations are located at frame 93 starboard side in Passageway (1-82-1-L) and frame 227 centerline in Passageway (2-207-0-L). In addition to the normal fire equipment located at all the fireplugs, these two stations are equipped with an in-line foam proportioner and pickup tube designed to produce 6% AFFF foam, a fifty foot length of fire hose with a 1.5" foam nozzle, and at least four five-gallon containers of AFFF foam liquid concentrate.
- A balanced pressure-type AFFF supply and proportioning system consisting of a 50-gallon AFFF concentrate tank, motor driven foam concentrate pump, ratio-flow proportioner, valves and controls, located in the Winch Machinery Space (01-95-1-Q) provides 6% AFFF to the following locations:
  - a. Flight Deck Hose Stations located at Frame 130 port and starboard sides 01 level, as well as frame 210 starboard side in the Vestibule (1-207-1-L) for flight operations.
  - b. AFFF hose reels in the Engine Room (3-104-0-E) and Auxiliary Machinbery Space #1 (2-82-0-E); these hose reels were converted from the twin agent units originally installed in these spaces.
  - c. AFFF sprinkling system for the Helicopter Hangar (01-117-0-Q).
- The following magazines are protected by a sea water sprinkling system.
  - a. 76 mm Magazine (1-26-0-M)
  - b. Small Arms Magazine (2-214-2-M)
- Salt water sprinklers are installed to thoroughly washdown all weather decks and the exterior portions of the superstructure. This system is primarily designed to eliminate radioactive contamination and is not intended for firefighting purposes.
- Portable CO_2 and PKP fire extinguishers are installed throughout the cutter.

The above list indicates that this cutter is well-equipped with adequate quantities and appropriate types of automated and manual fire extinguishment equipment for responding to fire emergencies on this vessel.

3.1.5. POST-EXTINGUISHMENT

The 270' WMEC is equipped with adequate means to desmoke compartments and test the atmosphere in affected compartments for the presence of oxygen and toxic gases. In addition, the ship is equipped with adequate tools, supplies, and repair parts to efficiently restore vital ship's systems following a fire incident.

3.2. SAFE INPUT DATA

The baseline analysis is founded on information collected and observed during the ship visit. This section of the report presents a discussion concerning the input data needed to run SAFE.

There are two general types of input data required for SAFE, factual and subjective. Factual data includes:

- type, location, and condition of bulkhead and deck materials
- compartment deck area and height
- type, location, and quantity of automated and manual fire protection equipment
- type, location, and quantity of smoke, flame and heat detectors
- size and orientation of ventilation duct openings (exhaust and supply) and other ventilation openings
- estimates of cellulosics, plastics, and flammable liquid fuel loads

Subjective data is established based on engineering judgment, default values, and comparisons to similar parameters on other ships. This data includes:

- probabilities of flame termination
- fire safety objectives
- percent time monitored for each compartment
- applicable fire growth models

The following sections provide additional information concerning input data collected or determined for the 270' WMEC fire safety analysis categorized into factual and subjective input data.

3.2.1. FACTUAL INPUT DATA

Factual data is observed during the ship visit, determined from drawings and official documentation, or it is based on default values, rules of thumb and certain assumptions. Factual data also includes estimated data. For example it would be possible to exactly determine a compartment's fuel load by weighing each combustible. Since this is impractical, fuel loads are estimated based on engineering judgment and using rules of thumb determined from experience gained in numerous ship visits. The following sections describe the factual (and estimated) input data. Subjective input data which is based on engineering judgment is then discussed.

3.2.1.1. Ship's Geometry

The ship's drawings were converted into a three-dimension rendition using AutoCAD, Release 12. Each compartment shown on the Booklet of General Plans for a 270' WMEC (B-Class) cutter provided by the Coast Guard was assigned a Compartment Use Indicator (CUI). Most of the default values established in SAFE are based on CUI. Since some of the input data for the 270' WMEC relies on default values, CUI assignments are particularly important. Type

and location of bulkhead and deck materials are based on observations during the ship visit and are documented in Appendix B, Table B.2. [7] Compartment height and deck area are determined from the AutoCAD drawings and shown in Appendix B, Table B.1.1.

3.2.1.2. Automated and Manual Fire Protection Systems

The location, type, and quantity of installed and portable fire protection systems were obtained from information collected during the ship visit, the Damage Control Book and the Machinery Space Firefighting Doctrine. [7, 6, 5] This information is recorded in Appendix B, Table B.5. The Flammable Liquids Storeroom and JP-5 Pump Room are protected with a fixed CO_2 total flooding system. The Galley stove is protected by an aqueous potassium carbonate system. Portable CO_2 and PKP fire extinguishers are located throughout the cutter. Finally, firemain stations are installed throughout the cutter; some stations include AFFF reentry capability.

3.2.1.3. Fire Detection System

The location and zone of installed fire detectors is noted in the SPENCER Damage Control Book. [6] Fire detectors that are not located in ventilation ducts were observed during the ship visit. [7] The location, zone, type, and quantity of all installed fire and smoke detectors are shown in Appendix B, Table B.4, including the calculated time to detection.

3.2.1.4. Ventilation

The size and orientation of both ventilation duct and other openings in each compartment were observed during the ship visit. [7] The ventilation input data including area and average height of all ventilation openings in each compartment for the baseline analysis of the 270' WMEC are documented in Appendix B, Table B.1.2.

3.2.1.5. Fuel Loads

Estimates of cellulosics, plastics, and flammable liquid fuel loads, documented in Appendix B, Table B.7 were based on fuel loads observed in each compartment during the ship visit. [7]

3.2.2. SUBJECTIVE INPUT DATA

Engineering judgment expresses an experienced and knowledgeable person's degree of belief. The SFSEM is a probabilistic-based fire risk analysis methodology. Engineering judgment is therefore appropriate for:

- determining the likelihood that a fire will be terminated in a given compartment
- assigning firesafety objectives
- establishing other important parameters needed to run SAFE as discussed in the following sections

3.2.2.1. Probabilities of Flame Termination

Probabilities of flame termination are documented in Appendix B, Tables B.6.1, B.6.2, and B.6.3 for in port and at sea scenarios. SAFE default values were used extensively, especially for the probabilities of flame termination in compartments entered as a result of a thermal (T-bar) or massive (D-bar) failure of a barrier. Probabilities of passive, automated, and manual means of flame termination for each compartment given EB in that compartment were determined in accordance with the methodology documented in Appendix E of the final report of the Fire Safety Analysis of the 180' WLB Seagoing Buoy Tender [9]. These probabilities were calculated using network diagrams as described in Appendix F of the same report. [9] Probabilities were assigned to each of the subfactors at the lowest level of detail for I, A, and M values as described in Appendix G, of the report, and in the Theoretical Basis of the SFSEM. [9, 1] For example, the following illustrates how the "A-Value" of 0.71 was determined as the probability of flame termination by automated means in the Flammable Liquids Storeroom protected by an installed CO_2 flooding system:

Probability of Notification (An)

An = dan * nan* san = 0.95 * 0.99 * 0.99 = 0.93 where:

dan = probability of detection

nan = notification of Pilot House

san = sound the alarm

Probability of Preparation (Ap)

Ap = fap * vap * pap = 1.00 * 1.00 * 1.00 = 1.00 where:

fap = securing the fuel supply to internal combustion engines in the space

vap = securing the ventilation fans in the space

pap = securing the electrical power in the space

Probability of Agent Application (Aa)

Aa = saa * aaa * daa = 0.99 * 0.95 * 0.90 = 0.85 where

saa = automated system is properly aligned for operation

aaa = agent discharges from the nozzle(s)

daa = agent discharges on the fire

Probability of Fire Extinguishment (Ae)

Ae = qae * cae * bae = 1.00 * 1.00 * 0.90 = 0.90 where

qae = quantity of agent is adequate

cae = concentration of agent is adequate

bae = blackout occurs

Probability of Flame Termination by Automated Means (A)

$A = An * Ap * Aa * Ae = 0.93 * 1.00 * 0.85 * 0.90 = 0.71$

3.2.2.2. Fire Safety Objectives

In order to analyze the performance of a ship as a fire safety system, there must be acceptable performance standards or criteria established by cognizant authorities. These criteria are referred to as Fire Safety Objectives (FSOs). The development of FSOs should take into consideration life safety, property protection and mission impairment. Ideally, FSOs are established by owners or cognizant authorities who have been delegated responsibility for the management of ship operations and who are knowledgeable of fire protection engineering principles. In the Coast Guard, cognizant authorities are the appropriate program and support managers in Coast Guard Headquarters. In the absence of such input, FSOs were established by the engineer/analyst using the process described in this section. **Approval of this report implies concurrence with the FSOs established herein.**

FSOs are designed to establish the performance standard for a fire safety system taking into account all aspects of fire including flame movement, smoke movement, people movement (egress for the occupants), and the ability of the structure to withstand the fire's assault. In the SFSEM, smoke movement, people movement, and structural analysis modules are not yet fully developed, therefore the FSOs are presently established considering flame movement only.

FSOs were established for the 270' WMEC for each compartment utilizing the so-called traditional approach. It is the approach used over the past ten years in the fire safety analysis of fifteen classes of Coast Guard cutters. A number of limitations and drawbacks have been identified with the traditional approach, and there has been some discussion concerning the practicality and validity of establishing FSOs on a compartment basis. [10, 11] Even with these minor concerns, the traditional approach has merit and is considered a valid approach. The following paragraphs describe the traditional approach in more detail.

FSOs are established for each compartment in the cutter that may be analyzed by SAFE. Currently, magazines, flammable liquid tanks, and helicopter hangars are not analyzed due to the inability of SAFE to deal with explosion hazards. All other compartments are rated for both Magnitude of Acceptable Loss (MAL) and Frequency of Acceptable Loss (FAL). The MAL is established by assigning a rating to each of the following four factors for each compartment and then weighting these factors to determine an overall rating for the compartment:

- Life Safety (LS)
- Property Protection (PP)
- Primary Mission (PM)
- Secondary Mission (SM)

The weighting factors are different for each module in the SFSEM. For example, in the flame movement module, damage from flames affects the primary mission of the ship more than it causes life safety concerns. Whereas considering the effects of smoke, life safety will be the primary concern compared to property damage. Thus the weighting factors for the four factors

are adjusted for each module in the SFSEM. The weighting factors used to assign a MAL rating to each compartment in the 270' WMEC considering flame movement only are shown in the following expression:

$$\mathbf{MAL = 0.1*LS + 0.3*PP + 0.4*PM + 0.2*SM}$$

The MAL rating for each factor (LS, PP, PM, & SM) is permitted to be one of the following four integer values:

1. Established Burning (EB) is not acceptable.....1
2. EB is acceptable but Full Room Involvement (FRI) is not.....2
3. FRI is acceptable but Compartment Burnout (CBO) is not.....3
4. CBO is acceptable.....4

A MAL rating is assigned to each factor for each compartment, then the overall MAL rating is calculated according to the algebraic expression shown above and the truncated MAL rating is assigned to the compartment. For example, if the results of the calculation is 3.37, a MAL of 3 is assigned.

The ratings are assigned for each factor using engineering judgment and considering the effect flame movement has on each factor. Compartments whose total loss (CBO) would not significantly affect the ship's primary or secondary mission are typically assigned a rating of 4 for factors PM and SM. For example, most sanitary spaces, gear lockers, passageways, voids, water tanks, ladders, cofferdams, and certain storerooms, if totally lost, would not prevent the ship from performing its primary or secondary mission. Note, a compartment may contain a significant fuel load and contribute materially to the spread of a fire, but if its loss does not significantly affect the ship's mission, it receives a rating of 4. At the other extreme, flammable materials storage lockers, paint lockers, and other compartments containing extremely flammable materials representing a significant fire hazard are normally assigned a rating of 1 for the factors PM and SM.

The balance of the compartments are normally assigned a rating of 2 or 3 for the factors PM and SM. In general, if the compartment contains equipment vital to the ship's primary or secondary mission, and if its loss would likely result in the ship aborting its patrol and returning to homeport for repairs, it would be assigned a 2. On the other hand, if the compartment's loss would degrade, but not prevent, the ship's ability to perform its mission, it would receive a 3 rating. Examples of compartments typically rated 2 for the factors PM or SM are the Engine Room, Bridge, and Galley. Berthing Areas, Ship's Offices and Labs/Workshops are typically assigned a 3 rating for the factors PM and SM. Note, if a compartment would normally be assigned a MAL of 4 for PM and SM factors, but it contains wiring that serves vital systems or equipment in other spaces, the MAL rating for the PM and SM factors are assigned to match the rating assigned to those spaces which contain the vital systems or equipment.

The cost to replace a compartment's contents (machinery and outfit) is the primary consideration for assigning a rating to the property protection (PP) factor. Obviously, Engineering Spaces such as the Engine Room, Emergency Generator Room, Auxiliary Machinery Rooms contain very expensive machinery not only from an acquisition point of view

but the costs involved for the labor to install and align the equipment is significant as well. Thus these spaces are typically assigned a rating of 2 for the PP factor. A rating of 1 is assigned to spaces such as paint lockers and flammable materials storage lockers for the property protection factor due to the additional property damage that would undoubtedly occur in other adjacent spaces. A rating of 4 is assigned for the PP factor to those spaces whose total loss would be considered minimal (compared to other spaces). Finally, a rating of 3 is assigned for the PP factor to those compartments whose cost is not minimal but is considered far less than major engineering spaces. Examples of spaces assigned a 3 rating for the PP factor include the Galley, Scullery and spaces with some minor machinery such as sewage machinery spaces and potable water equipment rooms.

Ratings for the life safety (LS) factor take into account the likelihood that personnel will be injured by the fire (not by the smoke or toxic gases). This probability is affected by the likelihood that the space will be occupied, the accessibility of the space, the quantity of personnel likely to be in the space, and the likelihood that the occupants will be sleeping. Thus spaces such as the Paint Locker where personnel would be in danger even if EB occurs are assigned a rating of 1 for the LS factor. If EB can occur but personnel are not likely to be in serious danger unless FRI occurs receive a rating of 2 for the LS factor. If FRI can be tolerated but the entire compartment would have to be lost before personnel are in danger of being injured, a rating of 3 would be appropriate for the LS factor. Finally, if a compartment can be totally lost and still not endanger personnel, a rating of 4 can be assigned to the LS factor. After a rating has been assigned to all four factors the overall MAL rating for the compartment is calculated. This value is then used in the calculation for the Frequency of Acceptable Loss (FAL) as described in the next paragraph.

The FAL is related to the MAL. For example, it may be considered acceptable to lose a compartment with a MAL = 4 once a year but compartments with a MAL = 1 may be lost only once in a ship's lifetime (30 years). Based on MAL and FAL ratings established by engineering judgment for similar compartments in several classes of cutters, a correlation between MAL and FAL was determined by fitting a curve to the data points. The following algebraic relationship expresses this correlation and is used to establish the FAL based on the non-truncated MAL rating for each compartment:

$$\mathbf{FAL = 32.25 - (1.766 * MAL) - (0.214 * MAL^2) - (0.222 * MAL^3)}$$

The FSOs established for the 270' WMEC using the traditional approach described above are tabulated in Appendix B in Table B.3.

3.2.2.3. Percent Time Monitored

The time to detect a fire is a function of the percent time a compartment is monitored. There are two possible ways a compartment can be monitored: by the ship's crew or by an installed smoke, heat, or flame detector. In compartments monitored by installed detectors that are wired to a fully addressable central alarm panel, 95% is normally assigned (99% in the event of multiple detectors) as the percent time the compartment is monitored both in port and at sea. This value reflects the reliability expected with this type of detection system. As discussed earlier, since the detection system in SPENCER is not fully addressable, the percent time monitored in compartments with installed detectors was reduced as shown in Table B.4 in

Appendix B. In other compartments, not protected by detectors, engineering judgment was utilized to estimate the percentage of time around the clock a particular compartment is expected to be monitored (visited) by a crew member. The percentage of time each compartment is monitored in port and at sea is documented in Appendix B, Table B.4.

3.2.2.4. Fire Growth Models

There are 16 fire growth models in SAFE that describe the nature and distribution of fuel packages. The model selected pre-determines two extremely important fire growth parameters: alpha and Qmax. Alpha is the fire growth coefficient in the heat release rate formula in the pre-FRI fire growth regime. Qmax describes the maximum heat release rate that is permitted regardless of the fuel load. These parameters in the fire growth models were based on empirical data collected in full scale tests. These tests were conducted in warehouses, basements, and other non-shipboard scenarios. Consequently many of the available fire growth models are a poor match to shipboard conditions, however, their application in SAFE are considered to give conservative results. Fire growth models were assigned based on observations during the ship visit of the fuel loads in each compartment. [7] Fire growth models selected for the 270' WMEC are documented in Appendix B, Table B.8.

3.3. BASELINE FIRE SAFETY ANALYSIS RESULTS

The SFSEM was used to conduct the baseline analysis of the 270' WMEC following the nine step fire safety analysis procedure used in previous analyses of other cutters. The following sections discuss each of these steps in sequence.

3.3.1. LOAD DATABASE WITH SHIP'S GEOMETRY

The compartmentation shown in the 270' WMEC (B-Class) drawings provided by the Coast Guard was modeled in AutoCAD. The drawings thus produced in AutoCAD for each deck level are shown in Appendix A. Information concerning the deck area and compartment height is tabulated in Appendix B, Table B.1.1.

3.3.2. CONDUCT SHIP VISIT

The ship visit on the SPENCER was conducted during a three day visit on July 22-24, 1996. Results from this visit was documented for use in the preparation of SAFE input data. [7]

3.3.3. LOAD SAFE INPUT VALUES

SAFE input values that were used in the baseline analysis are documented in Appendix B. This data was based on the best available information collected from all sources including the ship visit, drawings, and written documentation. [7]

3.3.4. CALCULATE FRI TIMES AND POST-FRI HEAT RELEASE RATES

The Post-FRI heat release rates (Q) and FRI times are calculated in SAFE. These fire parameters are tabulated for each compartment in Appendix B, Table B.8. The algorithms for these calculations are described in the Theoretical Basis of the SFSEM. [1]

FRI time is a critically important fire parameter because it determines the length of time between EB and the development of sufficiently high compartment temperatures that full room involvement conditions are expected. When FRI is achieved, conditions in the compartment are assumed to be incapable of supporting life and the heat energy of the burning fuel is assumed to begin impacting the barriers. Therefore, if FRI time is infinite (or greater than 60 minutes for practical purposes) the fire will be limited to the compartment. On the other hand if FRI time is very short (for example, two or three minutes) there may be little chance that the fire party can respond quickly enough to extinguish the fire in the compartment unless there is little fuel load. In this event, the available fuel may be consumed quickly and the fire may be easily extinguished by the fire party. The ability to achieve FRI is dependent on ventilation. Stoichiometric burning conditions are assumed to exist in each compartment. In an actual ship many compartments may be rendered relatively air-tight, thus this is a conservative assumption. A review of the calculated FRI times tabulated in Appendix B, Table B.8 show expected results for all compartments.

3.3.5. RUN PROBABILISTIC MODEL

The individual target option was specified as an output option for running the probabilistic model in the fire safety analyses of previous cutters as well as the 270' WMEC. This option permits a rapid comparison of each compartment as a target compartment compared to pre-established fire safety objectives for fires that may originate in any compartment. In other words it provides a means to identify "victims" of fires which may start in any compartment (including the target) and ultimately involve the target compartment. Results of the baseline fire safety analysis with the individual target option run on the baseline data set is documented in Appendix C, Individual Target Option - Summary Level Reports and discussed in section 3.3.6.1 of this report. These results do not however, provide a great deal of insight into the primary "source compartments" for fires that ultimately result in the loss of target compartments. Furthermore, a careful review of results achieved in previous analyses revealed that the target compartments with the highest RLFs (most frequently lost compared to FSOs) were not the engineering spaces which have the highest frequency of EB. This result seemed counter-intuitive and prompted a thorough review of the algorithm associated with this output option in SAFE.

The review of the individual target option revealed that the algorithm requires independent fire paths to accurately accumulate results for the calculation of RLFs. The methodology, however, models the real world which, in general, does not produce independent fire paths. Thus, the algorithm calculates imprecise, albeit conservative, RLFs. Results are more accurate for engineering spaces and less accurate for other spaces causing them to have higher-than-actual RLFs (less fire safe). Since these results do not lend any insight into the primary sources of fires, the probabilistic model was also run specifying the barrier output option to obtain information relative to sources of fires. Results of the baseline fire safety analysis with the barrier option run on the baseline data set is documented in Appendix C, Barrier Option - Summary Level Report. These results indicate that the barriers in the Engine Room (3-103-0-E) and Auxiliary Machinery Spaces (2-82-0-E and 3-82-0-E) are more likely to fail and are more likely to fail earlier than barriers in other compartments. Flammable liquids in these engineering spaces also represent a substantial class B fire threat and there are numerous ignition sources in these spaces. Therefore these compartments are considered the most likely sources of fires that

may spread to involve multiple compartments in the 270' WMEC. These results are discussed in more detail in section 3.3.6.2 of this report.

A review of the individual target option results provides insight into the performance of target compartments and a review of the barrier option provides insight into the sources of fires. By identifying probable fire paths (for one or two compartments beyond the room of origin) from likely rooms of origin, the crew can enhance their ability to develop realistic fire drill scenarios for training purposes. Accordingly, the results of the barrier option was used to help select probable rooms of origin and the path option in SAFE was run with these compartments selected as the rooms of origin. Results of the baseline fire safety analysis with the path option run on the baseline data set is documented in Appendix C, Path Option - Summary Level Report, and Path Option - Detail Level Report and discussed in section 3.3.6.3 of this report.

3.3.6. ANALYZE BASELINE RESULTS

The complete baseline results for the 270' WMEC are documented in Appendix C in the form of summary level and detail level reports specifying the following output options in SAFE:

- Individual Target Option - Summary Level Report (all 12 standard and non standard scenarios)
- Barrier Option - Summary Level Report (YOKE, In Port, I, A, & M scenario)
- Path Option - Summary Level Reports (YOKE, In Port, I, A, & M scenario for the following rooms of origin: Engine Room, Auxiliary Machinery Space #1 and Auxiliary Machinery Space #2)
- Path Option - Detail Level Reports (YOKE, In Port, I, A, & M scenario for the following rooms of origin: Engine Room, Auxiliary Machinery Space #1 and Auxiliary Machinery Space #2)

The following summarizes some of the basic assumptions made in SAFE and by the analysts that affect the results of the fire safety analysis:

- FRI times are based on a rise of ambient temperatures in the compartment of 500 degrees Celsius.
- Rate of heat release in the pre-FRI fire growth regime is based on an "alpha-T- squared" fire growth curve.
- Rate of heat release in the post-FRI fire growth regime is calculated according to the following formula: $1500*A*H^{0.5}$ (stoichiometric combustion conditions).
- The Ingberg conversion is used for the determination of heat energy impact on the barriers. Moreover this heat energy is assumed to impact the barriers only after FRI is achieved.
- Fire paths are assumed to be <u>independent</u> in the individual target option. Since actual fire paths are <u>dependent</u>, the results predict target compartments are not as safe as they actually are.
- In a fire, ventilation fans are usually secured. Significantly less air can flow through the ductwork than the natural vent opening assumed in the calculations.

- An unimpaired, fully trained 100-person crew is assumed to be on board underway. A fully manned and trained in port duty section is on board in port with the 13-15 persons in the repair party fully qualified for their roles.

The net effect of these assumptions on the results is considered conservative. In other words it is believed that the fire safety of this ship is actually better (safer) than results indicate.

3.3.6.1. Individual Target Option

Excerpts from the individual target option results are shown in Tables 3.1, 3.2, and 3.3 and list all compartments with RLFs greater than or equal to 0.02 and a MAL of 1, 2, or 3 in scenario 1 (XRAY, In Port, I, A, & M in effect). These three tables summarize the most interesting results of the baseline analysis. The RLFs shown in Table 3.1 for the two in port scenarios (XRAY and YOKE) are very similar. This indicates that there are relatively few doors, scuttles and hatches labeled YOKE. A review of the access classifications in Appendix B, Table B.2 reveals that there are only four watertight doors classified YOKE. Thus little difference between the two in port scenarios is to be expected.

A small portion of the differences in the two YOKE scenarios, in port and at sea (scenarios 2 and 3), shown in Table 3.1 may be attributed to the difference in the percent (time) monitored for each compartment in port and at sea as documented in Appendix B, Table B.4. In general, it is more likely that a crew member will discover a fire earlier at sea than in port due to the higher manning levels at sea. Therefore, lower RLFs (safer ship) are expected for at sea scenarios than in port scenarios. Another reason that accounts in part for the differences between the two YOKE scenarios shown in Table 3.1 is the fact that the relative contribution of manual suppression at sea is higher at sea than in port, thus lower RLFs are expected at sea when Manual suppression is in effect.

A review of the baseline fire safety analysis results show that with passive (I), automated (A), and manual (M) fire protection in effect, all compartments in the 270' WMEC exceed FSOs, in port and at sea. This means that no improvements are necessarily required to bring the 270' WMEC up to minimally acceptable fire safety levels.

Tables 3.2 and 3.3 compare varying levels of fire protection for the in port, XRAY and at sea, YOKE scenarios. As expected, the RLFs increase with decreasing levels of fire protection. The results also show that the rank ordering of compartments from most dangerous (highest RLF) to safest (lowest RLF) is approximately the same among the four scenarios. As shown in Tables 3.2 and 3.3, all compartments exceed FSOs with I & M in effect and with I, A, & M in effect. Moreover these results are nearly identical. This indicates that automated systems are not increasing the margin of safety provided by passive and manual protection.. This result is expected and attributed to the fact that only three compartments are protected by an automated system (other than Magazines and the Helicopter Hangar which are not analyzed in SAFE).

Table 3.1
Relative Loss Factors, Scenarios 1, 2, 3

Plan ID	Compartment Name	CUI	MAL	FAL	Run 17-81	Run 17-85	Run 19-101
					Scenario 1	Scenario 2	Scenario 3
					Xray, In Port	Yoke, In Port	Yoke, At Sea
3-152-0-E	ENGINEERING CONTROL CENTER	C	2	26	0.84	0.84	0.71
2-82-0-E	AUXILIARY MACHINERY SPACE #1	QA	2	26	0.78	0.78	0.78
3-103-0-E	ENGINE ROOM	EM	2	26	0.73	0.73	0.73
3-152A-0-E	ENGINE ROOM EXTENSION	EM	2	26	0.71	0.71	0.71
3-152-2-E	ENGINEERS WORKSPACE	QS	2	22	0.69	0.69	0.65
3-82-0-E	AUXILIARY MACHINERY SPACE #2	QA	2	26	0.47	0.47	0.47
2-72-2-L	CREWS LOUNGE	LL	2	20	0.42	0.42	0.42
2-165-2-L	CREWS LOUNGE	LL	2	20	0.10	0.10	0.09
1-117-0-L	CREWS MESS	LL	2	24	0.06	0.06	0.06
1-117-2-L	WARDROOM	LL	2	24	0.05	0.05	0.05
1-129-2-Q	SCULLERY	QG	2	20	0.05	0.05	0.05
1-141-2-Q	GALLEY	QG	2	26	0.05	0.05	0.05
1-201-1-Q	LIFE JACKET LOCKER	AG	2	21	0.04	0.04	0.04
3-228-0-E	STEERING GEAR ROOM	QA	2	26	0.02	0.02	0.02
02-48-0-C	PILOTHOUSE	C	2	26	0.02	0.02	0.01
2-47-1-C	IC ROOM	C	2	26	0.02	0.02	0.02

Compartments listed have
MAL of 1-3 and RLF>.02 in Scenario 1

All Scenarios include I, A, and M

Table 3.2
Relative Loss Factors, Scenarios 1, 4, 7, 10

Plan ID	Compartment Name	CUI	MAL	FAL	Run 17-81	Run 17-82	Run 17-83	Run 17-84
					Scenario 1	Scenario 4	Scenario 7	Scenario 10
					I, A & M	I & A	I & M	I Only
3-152-0-E	ENGINEERING CONTROL CENTER	C	2	26	0.84	1.08	0.84	1.08
2-82-0-E	AUXILIARY MACHINERY SPACE #1	QA	2	26	0.78	0.96	0.78	0.96
3-103-0-E	ENGINE ROOM	EM	2	26	0.73	0.84	0.73	0.84
3-152A-0-E	ENGINE ROOM EXTENSION	EM	2	26	0.71	0.80	0.71	0.80
3-152-2-E	ENGINEERS WORKSPACE	QS	2	22	0.69	0.95	0.69	0.95
3-82-0-E	AUXILIARY MACHINERY SPACE #2	QA	2	26	0.47	0.55	0.47	0.55
2-72-2-L	CREWS LOUNGE	LL	2	20	0.42	0.53	0.42	0.53
2-165-2-L	CREWS LOUNGE	LL	2	20	0.10	0.16	0.10	0.16
1-117-0-L	CREWS MESS	LL	2	24	0.06	0.09	0.07	0.10
1-117-2-L	WARDROOM	LL	2	24	0.05	0.07	0.06	0.08
1-129-2-Q	SCULLERY	QG	2	20	0.05	0.05	0.05	0.06
1-141-2-Q	GALLEY	QG	2	26	0.05	0.05	0.08	0.09
1-201-1-Q	LIFE JACKET LOCKER	AG	2	21	0.04	0.05	0.04	0.05
3-228-0-E	STEERING GEAR ROOM	QA	2	26	0.02	0.03	0.02	0.03
02-48-0-C	PILOTHOUSE	C	2	26	0.02	0.03	0.02	0.03
2-47-1-C	IC ROOM	C	2	26	0.02	0.03	0.02	0.03

Compartments listed have
MAL of 1-3 and RLF>.02 in Scenario 1

All Scenarios are XRAY, In Port

Table 3.3
Relative Loss Factors, Scenarios 3, 6, 9, 12

Plan ID	Compartment Name	CUI	MAL	FAL	Run 19-101	Run 19-102	Run 19-103	Run 19-104
					Scenario 3	Scenario 6	Scenario 9	Scenario 12
					I, A & M	I & A	I & M	I Only
3-152-0-E	ENGINEERING CONTROL CENTER	C	2	26	0.71	1.08	0.71	1.08
2-82-0-E	AUXILIARY MACHINERY SPACE #1	QA	2	26	0.78	0.96	0.78	0.96
3-103-0-E	ENGINE ROOM	EM	2	26	0.73	0.84	0.73	0.84
3-152A-0-E	ENGINE ROOM EXTENSION	EM	2	26	0.71	0.80	0.71	0.80
3-152-2-E	ENGINEERS WORKSPACE	QS	2	22	0.65	0.95	0.65	0.95
3-82-0-E	AUXILIARY MACHINERY SPACE #2	QA	2	26	0.47	0.55	0.47	0.55
2-72-2-L	CREWS LOUNGE	LL	2	20	0.42	0.53	0.42	0.53
2-165-2-L	CREWS LOUNGE	LL	2	20	0.09	0.16	0.09	0.16
1-117-0-L	CREWS MESS	LL	2	24	0.06	0.09	0.07	0.10
1-117-2-L	WARDROOM	LL	2	24	0.05	0.07	0.06	0.08
1-129-2-Q	SCULLERY	QG	2	20	0.05	0.05	0.05	0.06
1-141-2-Q	GALLEY	QG	2	26	0.05	0.05	0.08	0.09
1-201-1-Q	LIFE JACKET LOCKER	AG	2	21	0.04	0.05	0.04	0.05
3-228-0-E	STEERING GEAR ROOM	QA	2	26	0.02	0.03	0.02	0.03
02-48-0-C	PILOTHOUSE	C	2	26	0.01	0.03	0.01	0.03
2-47-1-C	IC ROOM	C	2	26	0.02	0.03	0.02	0.03

Compartments listed have
MAL of 1-3 and RLF>.02 in Scenario 1

All Scenarios are YOKE, At Sea

With just passive protection in effect, one compartment fails to meet FSOs, one other compartment is very close to failing to meet FSOs, while all other compartments exceed FSOs. Therefore manual fire extinguishment must augment passive fire protection in order for the 270' WMEC to meet fire safety objectives in all compartments. A comparison of results between I only and I & A also shows the minimal contribution of automated fire protection systems to the overall fire safety of the ship. The increase between I & A and I, A, &M results is due to the improvement added by manual firefighting efforts. The effectiveness of manual fire protection is based on the premise that there are 100 persons in the crew which supports repair parties of 13-15 persons; a substantial reduction in crew size/repair party size would require additional analysis to determine the impact on fire safety. In summary, **the 270' WMEC exceeds fire safety objectives in port and at sea in all compartments only if the contribution of manual firefighting is included.**

3.3.6.2. Barrier Option

The barrier option in SAFE provides the following details for all barriers in all rooms of origin which failed in the specified model run (e.g. YOKE, In Port, I, A, & M in effect):

- Room of origin plan ID (the listing is sorted first on the rooms of origin)
- The FRI time for each room of origin
- Room of origin's probability of loss given EB (secondary sort)
- Relative frequency of loss given fire free state in the room of origin
- Adjacent compartment's plan ID
- Time in minutes that the barrier fails from the start of the model run
- Probability of loss given EB in the adjacent compartment
- Relative frequency of loss given fire free state in the adjacent compartment
- Whether the barrier had an open access or was a zero strength barrier

A review of the barrier option results in Appendix C show that the following compartments are probable rooms of origin leading to EB in adjacent compartments in the 270' WMEC:

- Engine Room (3-103-0-E)
- Auxiliary Machinery Space #1 (2-82-0-E)
- Auxiliary Machinery Space #2 (3-82-0-E)
- Laundry (1-47-1-Q)

This result is attributed to a combination of the following factors: relatively high frequencies of EB in some of these compartments, the relatively short FRI times in these spaces, relatively high fuel loads, and the larger numbers of adjacent spaces which yield more fire paths.

A review of the barrier option results provides insight into probable rooms of origin that may contribute to fires that could eventually involve multiple compartments. These results

coupled with the detailed path option results provide useful information on the adjacent rooms in potential fire paths and help the crew to formulate realistic fire drill scenarios. The next section discusses the path option results from the baseline analysis of the 270' WMEC.

3.3.6.3. Path Option

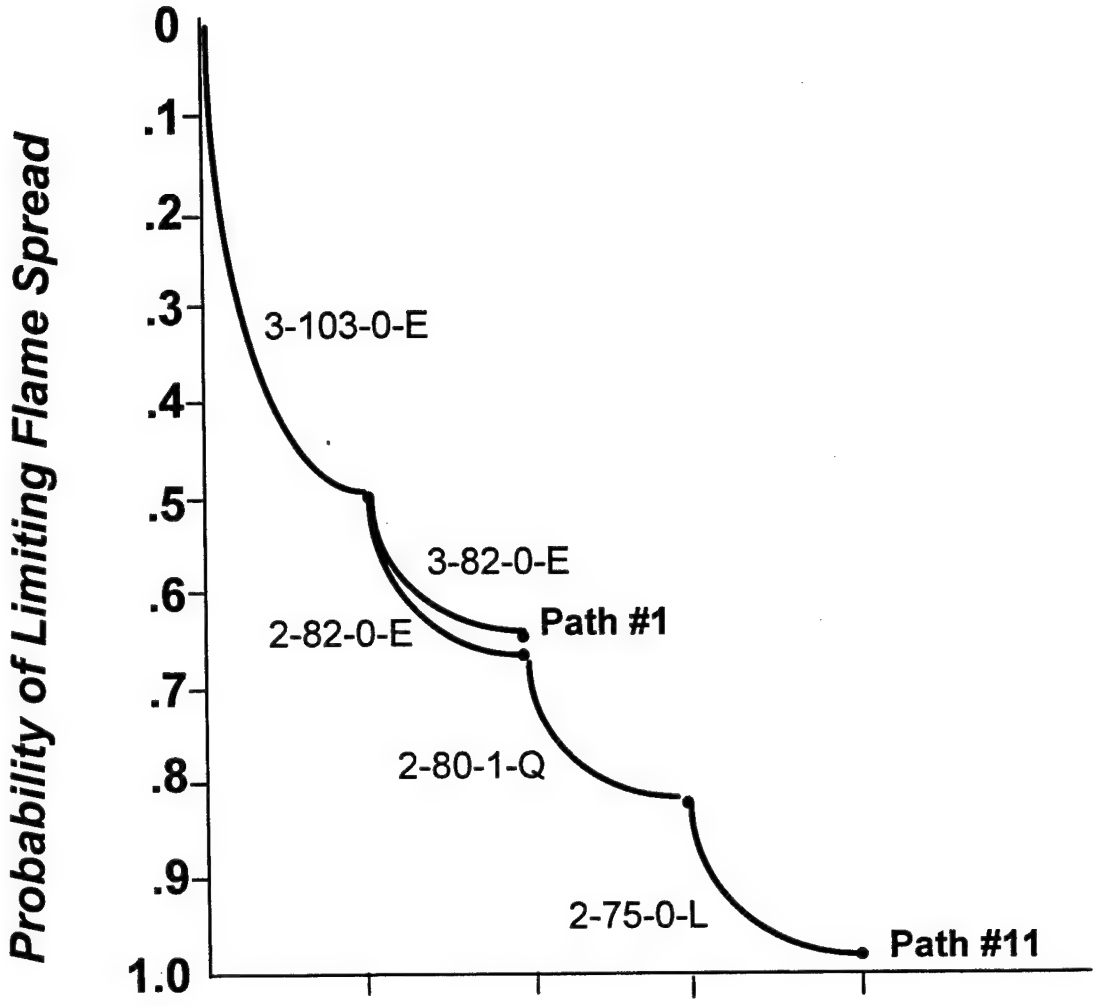
The path option in SAFE provides the following details for all fire paths from a user-specified room of origin in a user-specified scenario (e.g. YOKE, At Sea, I, A, & M in effect):

- The time established burning will occur in each room in the fire path
- The FRI time for each room in the fire path
- The time to compartment burnout for each room in the fire path
- The cumulative probability of limiting the fire in the room of origin and in each succeeding room in the fire path
- The cumulative probability of limiting the fire for each barrier that fails allowing the fire to enter the next room
- The mode of failure for each barrier (T-bar or D-bar)

The information provided in the detailed reports from SAFE for the path option provides the necessary information to construct a graphical representation of all possible cumulative L-Curves from any specified room of origin. The barrier option, detailed reports from the target option, and engineering judgment were used to select the Engine Room (3-103-0-E) and the Auxiliary Machinery Spaces (2-82-0-E and 3-82-0-E) as highly probable rooms of origin in the 270' WMEC. The path option was specified and summary level and detail level reports were generated for these three compartments. The YOKE, In Port, I, A, & M in effect scenario was selected because the in port scenario with all active and passive measures in effect provides worst case results for crew firefighting training. Results from the path option were used to construct L-Curves, shown in Figures 3.1 through 3.3 that provide the following useful information:

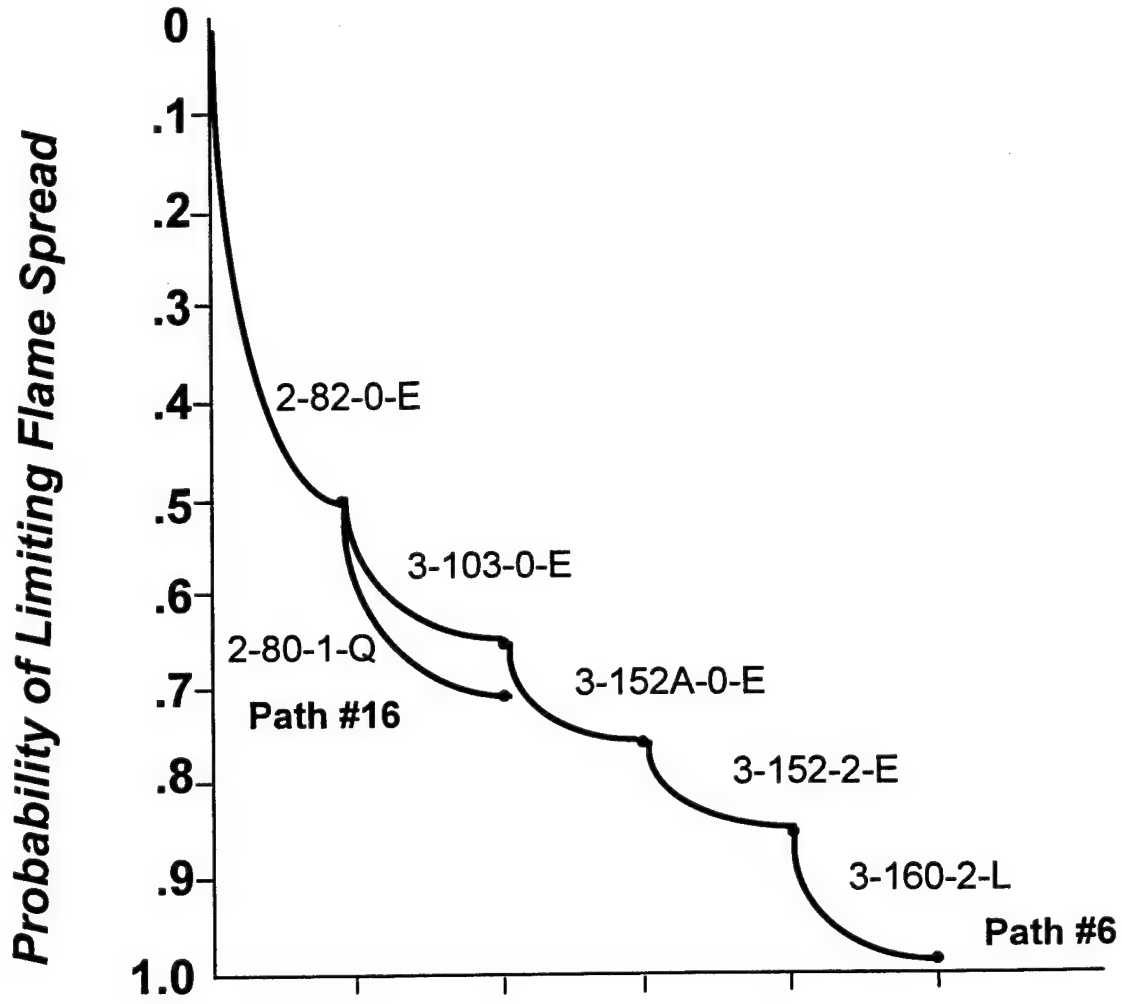
- The L-Curve for the fire path with the least cumulative probability of limiting the fire (the highest probability of fire spread).
- The L-Curve for the fire path with the highest cumulative probability of limiting the fire (the least probability of fire spread).
- The expected time established burning will occur in each room in each fire path illustrated.
- The cumulative probability of limiting the fire for each room and barrier in the fire paths shown.

By plotting the L-Curve for the highest and the least cumulative probability of limiting the fire, an "envelope" of L-Curves is shown that brackets all the L-Curves for the room of origin which may include dozens of additional fire paths. The following discussion presents observations from an analysis of the path option results illustrated by the cumulative L-Curves shown in Figures 3.1, 3.2, and 3.3.



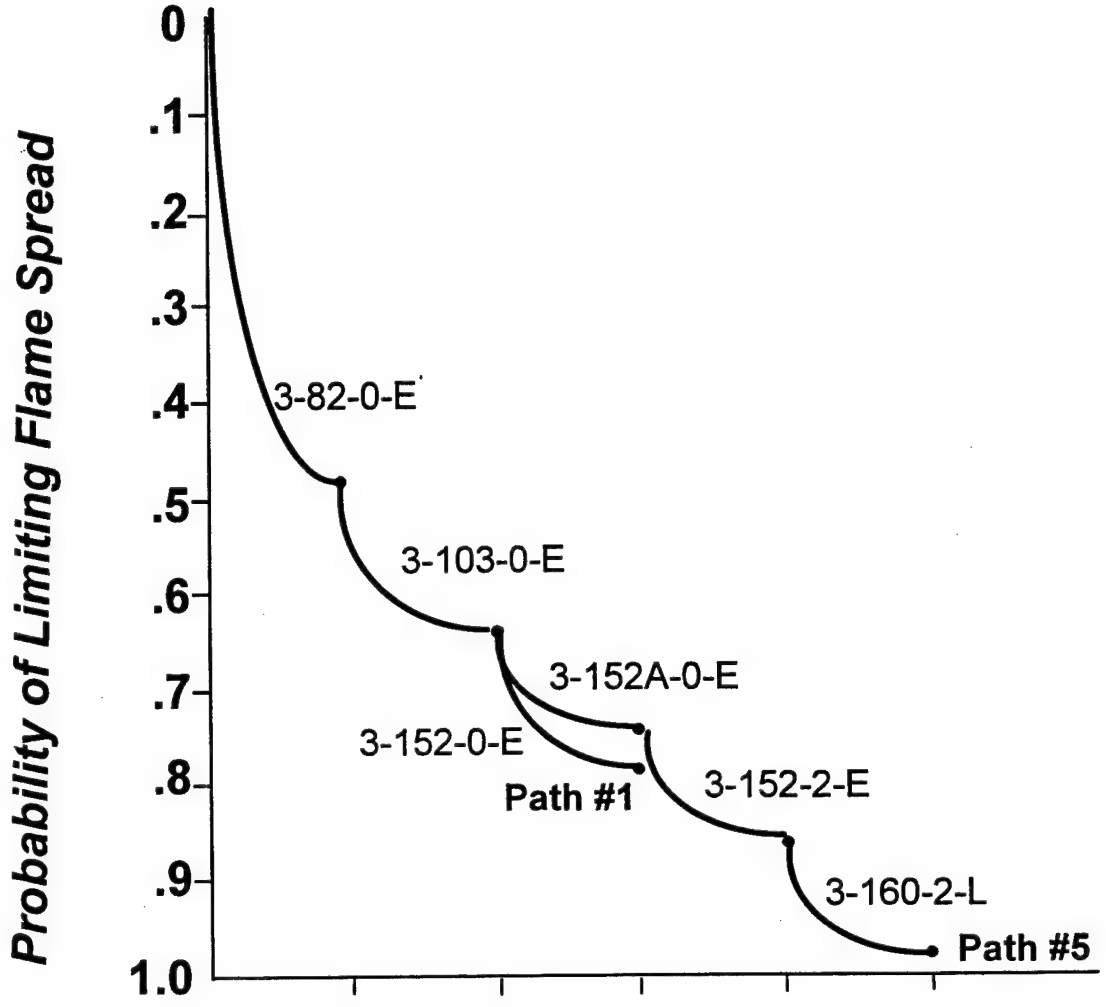
Time to EB (minutes)				
Path #1	0	6		
Path #11	0	6	8	11

Figure 3.1
Envelope of L-Curves from Engine Room (3-103-0-E)



Time to EB (minutes)					
Path #16	0	2			
Path #6	0	5	8	9	9

Figure 3.2
Envelope of L-Curves from Auxiliary Machinery Space #1 (2-82-0-E)



Time to EB (minutes)					
Path #1	0	5	9		
Path #5	0	5	8	9	9

Figure 3.3
Envelope of L-Curves from Auxiliary Machinery Space #2 (3-82-0-E)

Each plot shows the cumulative probability of limiting the fire on the ordinate axis and the sequential rooms in the fire path on the abscissa axis. Note the simulation run time was set to 60 minutes for all scenarios. In general, cumulative probabilities of limiting the flame improve with longer run times. The room of origin is always shown as the first room in the path. Thus the probability of limiting the fire in the room of origin is the first data point plotted along the curve starting from zero at the top left of the graph. The next point on the L-Curve plots shown is the cumulative probability of limiting the flame in the next room in the fire path. A vertical segment between rooms represents the strength of the barrier between the two compartments. In the L-Curve plots shown in Figures 3.1 through 3.3 all intermediate barrier values happen to be zero (or so near zero, that they can't be distinguished on the plot). There are three possible reasons for a barrier to exhibit zero strength:

- The barrier is a zero-strength barrier. Zero-strength barriers are frequently used to break up long passageways and multiple level compartments. They are also useful to separate one large compartment into two or more compartments to realistically model the different fuel loads and fire threats that may exist within the one large compartment.
- Due to relatively short FRI times and high heat release rates in the compartment, the barrier experiences a D-bar or T-bar failure within the first minute of the compartment reaching FRI. SAFE analyzes the T-bar/D-bar curves once every minute. An open door or large hatch is automatically a D-bar failure as is a zero-strength barrier. The Theoretical Basis of the SFSEM describes T-bar and D-bar failure modes for barriers. [1]
- The fire spreads into two or more rooms simultaneously (or within one minute) through a common barrier. This is frequently the case when time to EB is identical for the spaces involved.

The L-Curves shown in Figure 3.1 represent the fire paths with the highest and lowest cumulative probability of loss from fires originating in the Engine Room (3-103-0-E). For the purposes of modeling the geometry of this cutter the Engine Room Extension (3-152A-0-E) is considered a separate compartment, however it is actually the portion of the Engine Room that extends below the Engineering Control Center (3-152-0-E). In SAFE these two compartments are separated by a zero-strength barrier. Path #1 represents the most dangerous fire path insofar as it represents the path with the least cumulative probability of limiting the flame after 60 minutes. The times to EB are shown to provide a sense of how much time a firefighting crew would have to respond. Path #1 shows that EB will occur in six minutes in the Auxiliary Machinery Space #2 (3-82-0-E). The Engine Room has a FRI time of three minutes (Table B.8, Appendix B), this means that EB will occur in the Auxiliary Machinery Space #2 nine minutes from the time EB occurs in the Engine Room. However there is a 50% probability that the fire will be limited to the Engine Room in the first place. Or stated another way, there is a 50% probability that fires starting in the Engine Room will spread to involve other compartments. Appendix C includes details of all probable paths from the Engine Room some of which involve a second room other than the Auxiliary Machinery Space #2. Path #11 shows the fire path with the highest probability of limiting the flame after 60 minutes. This fire path shows the fire spreading from the Engine Room to the Auxiliary Machinery Space #1 (2-82-0-E), to the Cleaning Gear Locker (2-80-1-Q) and finally to the Sanitary Space (2-75-0-L). There is a 99%

probability that the fire will be limited in one of these compartments within 60 minutes of EB in the Engine Room. Note the details of all other fire paths originating in the Engine Room are shown in Appendix C. The firefighting crew may construct other training scenarios based on this data.

The L-Curves shown in Figure 3.2 represent the fire paths with the highest and lowest cumulative probability of loss from fires originating in Auxiliary Machinery Space #1 (2-82-0-E). Path #16 represents the fire path with the least cumulative probability of limiting the flame after 60 minutes. Path #16 shows that EB will occur in two minutes in the Cleaning Gear Locker (2-80-1-Q). The Auxiliary Machinery Space #1 has a FRI time of two minutes (Table B.8, Appendix B), this means that EB will occur in the Cleaning Gear Locker four minutes from the time EB occurs in the Auxiliary Machinery Space #1. Path #16 shows that there is a 50% probability that the fire will be limited to the Auxiliary Machinery Space #1 and a 70% chance that it will be limited to either the Auxiliary Machinery Space #1 or the Cleaning Gear Locker. Appendix C includes details of all probable paths from the Auxiliary Machinery Space #1 many of which involve a second room other than the Cleaning Gear Locker. Path #6 shows the fire path with the highest probability of limiting the flame after 60 minutes. This fire path shows the fire spreading from the Auxiliary Machinery Space #1, through the Engine Room (3-103-0-E) and Engine Room Extension (3-152A-0-E), then up to the Engineer's Workspace (3-152-2-E), and finally to the Sanitary Space (3-160-2-L). There is a 99% probability that the fire will be limited in one of these compartments within 60 minutes of EB in the Engine Room. Based on the times to EB in each of the compartments in fire path #6, the firefighting crew has relatively little time to prevent the fire from spreading. The firefighting crew may construct other training scenarios based on the data shown in Appendix C.

Figure 3.3 shows the envelope of L-Curves with the Auxiliary Machinery Space #2 (3-82-0-E) selected as the room of origin. Path #1 represents the path with the smallest cumulative probability of limiting the flames. This path begins in the Auxiliary Machinery Space #2, spreads to the Engine Room (3-103-0-E), and finally terminates in the Engineering Control Center (3-152-0-E) where there is a 78% probability of limiting the flame after 60 minutes in one of these three compartments. Even though this represents the path with the least cumulative probability of limiting the flame, it may be worthwhile to consider other paths for training purposes as well. For example, Path #5, which represents the path with a 99% cumulative probability of limiting the flame, begins in the Auxiliary Machinery Space #2 and spreads aft to the Engine Room (3-103-0-E) and Engine Room Extension (3-152A-0-E), then upward to the Engineer's Workspace (3-152-2-E) and finally to the Sanitary Space (3-160-2-L).

Figures 3.1 through 3.3 are based on data contained in Appendix C. Valuable insight may be gained for planning realistic fire drill scenarios by plotting L-Curves such as those illustrated in Figures 3.1 through 3.3 and studying likely multiple room fire scenarios.

3.3.7. ANALYZE FIRE PROTECTION ALTERNATIVES

Since all compartments in the 270' WMEC exceed their FSOs with passive, automated and manual fire protection in effect, it is not necessary to consider alternatives to improve the fire safety in any compartment. However, the non-continuous joiner bulkheads installed on the Second Deck and above may be responsible for increasing the probability of fire spread to other

compartments through the interstitial spaces above the dropped ceiling. Thus this situation may be partially responsible for the overall fire safety levels in this cutter to be less safe (but still acceptable) than if the joiner bulkheads were continuous to the deck above. Therefore it is desirable to study and quantify the impact of the non-continuous joiner bulkheads. In addition, the results of the barrier and target option show that the Engine Room and Auxiliary Machinery Spaces are the most probable rooms of origin that could eventually spread to involve multiple adjacent compartments. There is no automated fire protection system in any of these spaces. Therefore it is desirable to study and quantify the effect of various alternative automated fire protection systems that could potentially be installed in these compartments. Thus the analysis of alternatives phase of this project is devoted to a comprehensive study of the non-continuous joiner bulkheads installed on the Second Deck and above in this class cutter and alternative automated systems installed in the Engine Room and the Auxiliary Machinery Spaces. Section 4.0 of this report provides a detailed discussion of the analysis of alternatives phase of this project.

3.3.8. CONDUCT COST-BENEFIT ANALYSIS

The goal of the fire safety analysis is to maximize the benefit (improvement in fire safety), while minimizing the costs (dollars and other intangible factors) of the changes. A cost-benefit analysis is thus considered an important part of alternative design evaluation. Within the constraints of time and allowable funds, as many alternatives as possible are studied to permit a useful cost-benefit analysis. Since no improvements are required to bring the ship up to minimally acceptable standards, a cost-benefit analysis of alternatives is not applicable for the 270' WMEC.

3.3.9. DOCUMENT RESULTS

This report contains comprehensive results and provides the basis of assumptions and estimates when complete or factual information was not available. The appendices present the input data and detailed output results from SAFE. Additional insight may be gained by referring to the other technical reports and documents referenced throughout this report.

4. ANALYSIS OF ALTERNATIVES

The analysis of alternatives phase usually involves consideration of hypothetical improvements in compartments which fail to meet their fire safety objectives. Less frequently, this phase is used to study ways to reduce or eliminate over-protection in compartments which exceed their fire safety objectives by a substantial margin. Even if no changes to the existing fire safety systems are considered necessary, this phase is frequently used to analyze specific firefighting agents or techniques, fire protection systems, or other features of the ship's design that affect fire safety. By changing the appropriate data in the baseline data set, any hypothetical change can be studied by comparing outputs from the target, barrier and/or path options available in SAFE.

As noted in section 3.0 of this report, all compartments in the 270' WMEC exceed their fire safety objectives with passive, manual, and automated fire protection systems in effect. Therefore no changes to the existing fire safety systems are required to bring the ship up to minimally acceptable fire safety standards. Baseline results also show that FSOs are not exceeded by a substantial margin, therefore reduction of existing fire protection systems is not warranted. While these results are in general agreement with previous fire safety analyses of other Coast Guard cutter classes, they are actually somewhat worse (i.e. higher RLFs or less safe) than other cutter classes. These results are attributed in part to relatively lower probabilities of flame termination. One of the many factors that affect these probabilities is the probability of suppressing the fire through automated fire protection systems. In this class cutter there are very few automated systems, thus the probabilities of flame termination are not significantly improved when automated systems are taken into account. In addition, many of the joiner bulkheads installed on the Second Deck and above in this class cutter terminate at the height of the dropped ceiling, thus they are not continuous to the deck above. Therefore additional fire paths may be created that continuous bulkheads would have prevented. It is desirable to quantify the impact these non-continuous bulkheads have on the overall fire safety of the cutter. The next subsection discusses the results of this non-continuous joiner bulkhead study.

4.1. NON-CONTINUOUS JOINER BULKHEADS

Fires that originate in a compartment may spread to adjacent compartments through open doors, ventilation duct openings, and other openings in decks, bulkheads and overheads or by a thermal (Tbar) or massive (Dbar) failure of these "barriers" to prevent the passage of flame and smoke. All barriers will resist the spread of flames for a period of time; the "stronger" the barrier, the longer it will resist the heat energy impact from the flames.

As explained in the Theoretical Basis of the SFSEM, the existing barriers that define a ship's compartmentation are selected from the catalog of barriers which characterize the barrier's thermal strength and physical properties. [1] SAFE then determines the time each barrier will "fail" thus contributing to the formation of a fire path. In the 270' WMEC many compartments on the Second Deck and above contain dropped ceilings and joiner bulkheads which terminate at the height of the dropped ceiling. The interstitial spaces created above the dropped ceiling and below the deck above typically span an area equivalent to several compartments below. Ideally, these interstitial spaces are modeled as an additional deck level to accurately model the actual

compartmentation. This technique was successfully employed in the Fire Safety Analysis of the USCGC VINDICATOR (WMEC 3). [12] However, these additional levels added to the six existing levels in the 270' WMEC exceed the maximum number of levels that can be modeled in SAFE. Therefore as an alternative, the non-continuous joiner bulkheads were "derated" by 90% as shown in Table B.2 in Appendix B to simulate the ease with which fire can spread to involve adjacent compartments. Derating a barrier is normally used to account for deterioration and other defects that "weaken" the barrier's ability to withstand the heat energy impact from the flames. The value of 90% was determined by engineering judgment and reflects the relatively weak thermal strength of the dropped ceiling material.

To study the impact of the non-continuous bulkheads on the overall fire safety of the cutter the baseline data set was altered to create an alternative data set with the deratings eliminated for these bulkheads; the target option was then run on the alternative data set. This is equivalent to modeling these bulkheads as if they were continuous to the deck above. The results from the target option can then be compared to the baseline to quantify the effect of the non-continuous bulkheads on the overall fire safety of the cutter. Table 4.1 summarizes the results from the target option with the deratings eliminated compared to the baseline for the XRAY, In Port scenarios. Table 4.2 includes similar results for the YOKE, In Port scenarios. The results in Tables 4.1 and 4.2 are essentially identical and show that the non-continuous bulkheads have a negligible effect on fire safety. As expected, the RLFs in target compartments are less when the derating is removed indicating the cutter would be safer, but the change in RLFs is very slight. The percentage of improvement in the margin of safety gained by eliminating the derating (equivalent to installing continuous bulkheads) in the XRAY, In Port scenario is generally less than 0.5% as shown in Table 4.3. This result is attributed to the fact that the compartments affected are typically sanitary spaces and crew living quarters which generally contribute little to fire growth in the first place. The actual target option SAFE output runs associated with this study are documented in Appendix D.1.

The results shown in Table 4.3 quantifies the improvement in the margin of safety due to the elimination of non-continuous joiner bulkheads in this class cutter. This benefit may be achieved by extending the existing non-continuous joiner bulkheads to the deck above. Implementing this change in the 270' WMEC class cutter is not recommended due to the following reasons:

- The cost of retrofitting all non-continuous joiner bulkheads with bulkheads that are continuous to the deck above in all 270' WMEC class cutters is considered substantial.
- Only 6 compartments benefit from the change and these compartments already exceed fire safety objectives with passive, manual, and automated fire protection systems in effect. Moreover, the improvement in the margin of safety by implementing this change is very slight.

Table 4.1
Relative Loss Factors, Scenarios 1, 4, 7, 10

Plan ID	Compartment Name	I, A, & M		I & A		I & M		I Only	
		Run 17-81	Run 18-89	Run 17-82	Run 18-90	Run 17-83	Run 18-91	Run 17-84	Run 18-92
		Baseline	No Derating	Baseline	No Derating	Baseline	No Derating	Baseline	No Derating
3-152-0-E	ENGINEERING CONTROL CENTER	0.84	0.83	1.08	1.07	0.84	0.83	1.08	1.07
2-82-0-E	AUXILIARY MACHINERY SPACE #1	0.78	0.77	0.96	0.96	0.78	0.77	0.96	0.96
3-103-0-E	ENGINE ROOM	0.73	0.72	0.84	0.83	0.73	0.72	0.84	0.83
3-152A-0-E	ENGINE ROOM EXTENSION	0.71	0.71	0.80	0.80	0.71	0.71	0.80	0.80
3-152-2-E	ENGINEERS WORKSPACE	0.69	0.69	0.95	0.95	0.69	0.69	0.95	0.95
3-82-0-E	AUXILIARY MACHINERY SPACE #2	0.47	0.47	0.55	0.55	0.47	0.47	0.55	0.55
2-72-2-L	CREWS LOUNGE	0.42	0.42	0.53	0.53	0.42	0.42	0.53	0.53
2-165-2-L	CREWS LOUNGE	0.10	0.10	0.16	0.16	0.10	0.10	0.16	0.16
1-117-0-L	CREWS MESS	0.06	0.06	0.09	0.09	0.07	0.07	0.10	0.10
1-117-2-L	WARDROOM	0.05	0.05	0.07	0.07	0.06	0.06	0.08	0.08
1-129-2-Q	SCULLERY	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
1-141-2-Q	GALLEY	0.05	0.05	0.05	0.05	0.08	0.08	0.09	0.09
1-201-1-Q	LIFE JACKET LOCKER	0.04	0.04	0.05	0.05	0.04	0.04	0.05	0.05
3-228-0-E	STEERING GEAR ROOM	0.02	0.02	0.03	0.03	0.02	0.02	0.03	0.03
02-48-0-C	PILOTHOUSE	0.02	0.02	0.03	0.03	0.02	0.02	0.03	0.03
2-47-1-C	IC ROOM	0.02	0.02	0.03	0.03	0.02	0.02	0.03	0.03

Compartments listed have
MAL of 1-3 and RLF>.02 in Scenario 1

All Scenarios are XRAY, In Port

Table 4.2
Relative Loss Factors, Scenarios 1, 5, 8, 11

Plan ID	Compartment Name	I, A, & M		I & A		I & M		I Only	
		Run 17-85	Run 18-93	Run 17-86	Run 18-94	Run 17-87	Run 18-95	Run 17-88	Run 18-96
		Baseline	No Derating	Baseline	No Derating	Baseline	No Derating	Baseline	No Derating
3-152-0-E	ENGINEERING CONTROL CENTER	0.84	0.83	1.08	1.07	0.84	0.83	1.08	1.07
2-82-0-E	AUXILIARY MACHINERY SPACE #1	0.78	0.77	0.96	0.96	0.78	0.77	0.96	0.96
3-103-0-E	ENGINE ROOM	0.73	0.72	0.84	0.83	0.73	0.72	0.84	0.83
3-152A-0-E	ENGINE ROOM EXTENSION	0.71	0.71	0.80	0.80	0.71	0.71	0.80	0.80
3-152-2-E	ENGINEERS WORKSPACE	0.69	0.69	0.95	0.95	0.69	0.69	0.95	0.95
3-82-0-E	AUXILIARY MACHINERY SPACE #2	0.47	0.47	0.55	0.55	0.47	0.47	0.55	0.55
2-72-2-L	CREWS LOUNGE	0.42	0.42	0.53	0.53	0.42	0.42	0.53	0.53
2-165-2-L	CREWS LOUNGE	0.10	0.10	0.16	0.16	0.10	0.10	0.16	0.16
1-117-0-L	CREWS MESS	0.06	0.06	0.09	0.09	0.07	0.07	0.10	0.10
1-117-2-L	WARDROOM	0.05	0.05	0.07	0.07	0.06	0.06	0.08	0.08
1-129-2-Q	SCULLERY	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
1-141-2-Q	GALLEY	0.05	0.05	0.05	0.05	0.08	0.08	0.09	0.09
1-201-1-Q	LIFE JACKET LOCKER	0.04	0.04	0.05	0.05	0.04	0.04	0.05	0.05
3-228-0-E	STEERING GEAR ROOM	0.02	0.02	0.03	0.03	0.02	0.02	0.03	0.03
02-48-0-C	PILOTHOUSE	0.02	0.02	0.03	0.03	0.02	0.02	0.03	0.03
2-47-1-C	IC ROOM	0.02	0.02	0.03	0.03	0.02	0.02	0.03	0.03

Compartments listed have
MAL of 1-3 and RLF>.02 in Scenario 1

All Scenarios are YOKE, In Port

Table 4.3
Percent Change in RLFs

Plan ID	Compartment Name	I, A, & M		%	I & A		%	I & M		%	I Only		%
		Run 17-81	Run 18-89	Change	Run 17-82	Run 18-90	Change	Run 17-83	Run 18-91	Change	Run 17-84	Run 18-92	Change
		Baseline	No Derating		Baseline	No Derating		Baseline	No Derating		Baseline	No Derating	
3-152-0-E	ENGINEERING CONTROL CENTER	0.84	0.83	0.19%	1.08	1.07	0.24%	0.84	0.83	0.19%	1.08	1.07	0.24%
2-82-0-E	AUXILIARY MACHINERY SPACE #1	0.78	0.77	0.37%	0.96	0.96	0.31%	0.78	0.77	0.37%	0.96	0.96	0.31%
3-103-0-E	ENGINE ROOM	0.73	0.72	0.45%	0.84	0.83	0.49%	0.73	0.72	0.45%	0.84	0.83	0.49%
3-152A-0-E	ENGINE ROOM EXTENSION	0.71	0.71	0.28%	0.80	0.80	0.40%	0.71	0.71	0.28%	0.80	0.80	0.40%
3-152-2-E	ENGINEERS WORKSPACE	0.69	0.69	0.00%	0.95	0.95	0.00%	0.69	0.69	0.00%	0.95	0.95	0.00%
3-82-0-E	AUXILIARY MACHINERY SPACE #2	0.47	0.47	0.23%	0.55	0.55	0.25%	0.47	0.47	0.23%	0.55	0.55	0.25%
2-72-2-L	CREWS LOUNGE	0.42	0.42	0.14%	0.53	0.53	0.17%	0.42	0.42	0.14%	0.53	0.53	0.17%
2-165-2-L	CREWS LOUNGE	0.10	0.10	0.00%	0.16	0.16	0.00%	0.10	0.10	0.00%	0.16	0.16	0.00%
1-117-0-L	CREWS MESS	0.06	0.06	0.00%	0.09	0.09	0.00%	0.07	0.07	-0.84%	0.10	0.10	0.00%
1-117-2-L	WARDROOM	0.05	0.05	0.00%	0.07	0.07	0.00%	0.06	0.06	0.00%	0.08	0.08	0.00%
1-129-2-Q	SCULLERY	0.05	0.05	0.00%	0.05	0.05	0.00%	0.05	0.05	0.00%	0.06	0.06	0.00%
1-141-2-Q	GALLEY	0.05	0.05	0.00%	0.05	0.05	0.00%	0.08	0.08	0.00%	0.09	0.09	0.00%
1-201-1-Q	LIFE JACKET LOCKER	0.04	0.04	0.00%	0.05	0.05	0.00%	0.04	0.04	0.00%	0.05	0.05	0.00%
3-228-0-E	STEERING GEAR ROOM	0.02	0.02	0.00%	0.03	0.03	0.00%	0.02	0.02	0.00%	0.03	0.03	0.00%
02-48-0-C	PILOTHOUSE	0.02	0.02	0.00%	0.03	0.03	0.00%	0.02	0.02	0.00%	0.03	0.03	0.00%
2-47-1-C	IC ROOM	0.02	0.02	0.00%	0.03	0.03	0.00%	0.02	0.02	0.00%	0.03	0.03	0.00%

Compartments listed have
MAL of 1-3 and RLF>.02 in Scenario 1

All Scenarios are XRAY, In Port

4.2. ALTERNATIVE AUTOMATED FIRE PROTECTION SYSTEMS

The Auxiliary Machinery Spaces (2-82-0-E and 3-82-0-E) and the Engine Room (3-103-0-E) in the 270' WMEC Medium Endurance Cutter class are not presently protected by any automated fire protection system. Since these spaces are identified as highly probable rooms of origin that could lead to multiple room fires, it is desirable to quantify the effect alternative automated fire protection systems installed in these spaces has on the overall fire safety of the cutter. Therefore this study is focused on mitigating the class B fire threat in the Auxiliary Machinery Spaces and Engine Room. FM-200 (a Halon 1301 alternative) and CO_2 total flooding systems as well as Water Mist and AFFF sprinkling systems are appropriate alternative automated systems for the class B fire threat in these engineering spaces. This subsection of the report presents the results of this study.

In order to analyze alternative automated systems, the probability of flame limitation (A-values) is determined for all candidate systems. Alternative data sets are then created by altering the baseline data set to include the alternative A-Values as probabilities of flame limitation by automated means. The target option in SAFE is then run on the alternative data set. Results from the target option can then be compared to the baseline results to determine the change in baseline fire safety. Table 4.4 shows all of the factors and subfactors and calculations used to determine the A-values for alternative automated systems hypothetically installed in the Engine Room or Auxiliary Machinery Spaces. These factors were established in accordance with the Theoretical Basis of the SFSEM and Appendix E in the final report of the Fire Safety Analysis of the 180' WLB Seagoing Buoy Tender. [1, 9] Table 4.4 shows A-values for the following systems: CO_2, FM-200, Water Mist, and AFFF Sprinkling installed in the Engine Room and Auxiliary Machinery Spaces.

The baseline results show that the RLFs for all compartments with passive, automated and manual fire protection in effect are 0.84 or less for in port, XRAY and in port, YOKE scenarios. As the benefit of automated fire protection systems in the Auxiliary Machinery Spaces is reflected through A values greater than zero, RLFs for target compartments will decrease which indicates an increase in fire safety. The impact of employing alternative automated fire suppression systems and associated extinguishing agents in the Auxiliary Machinery Spaces is shown in Figures 4.1 through 4.3 by plotting the resulting RLFs for four target compartments (including the compartment with the highest RLF) for all possible A-values in the Engine Room and Auxiliary Machinery Spaces. Five discrete A-values for these spaces (0%, 25%, 50%, 75%, and 100%) were used to plot the data points. The I, A, and M values for all other spaces were left unchanged for all SAFE simulations, therefore the RLFs plotted in Figures 4.1 through 4.3 reflect the impact of an automated fire suppression system in the space(s) indicated. Since the relationship is linear, the data points were connected with straight lines as shown in Figures 4.1 through 4.3. Plotting RLFs in this manner permits determining RLFs directly from the Figures for any of the four target compartments shown for any possible A-value. Results for all target compartments are documented in appendix D.2.

Table 4.4
Alternative Automated System "A" Values

Auxiliary Machinery Space #1 (2-82-0-E)

Shaded columns are calculated

	dan	nan	san	An	dapf	sapf	capf	fap	dapv	sapv	capv	vap	dapp	sapp	capp	pap	Ap	saa	aaa	daa	Aa	qae	cae	bae	Ae	A
CO2	0.95	0.95	0.95	0.86	1.00	1.00	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.90	0.72	0.90	0.95	1.00	0.86	0.90	0.90	0.90	0.73	0.38
FM-200	0.95	0.95	0.95	0.86	1.00	1.00	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.90	0.72	0.95	0.99	1.00	0.94	0.90	0.90	1.00	0.81	0.47
Water Mist	0.95	0.95	0.95	0.86	1.00	1.00	0.80	0.80	1.00	1.00	0.80	0.80	1.00	1.00	0.90	0.90	0.58	0.85	0.90	0.90	0.69	1.00	1.00	0.95	0.95	0.32
AFFF Sprklg	0.95	0.95	0.95	0.86	1.00	1.00	0.80	0.80	1.00	1.00	0.80	0.80	1.00	1.00	0.80	0.80	0.51	0.85	1.00	0.80	0.68	0.90	1.00	0.80	0.72	0.21

Auxiliary Machinery Space #2 (3-82-0-E)

Shaded columns are calculated

	dan	nan	san	An	dapf	sapf	capf	fap	dapv	sapv	capv	vap	dapp	sapp	capp	pap	Ap	saa	aaa	daa	Aa	qae	cae	bae	Ae	A
CO2	0.70	0.90	0.95	0.60	1.00	1.00	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.90	0.72	0.90	0.95	1.00	0.86	0.90	0.90	0.90	0.73	0.27
FM-200	0.70	0.90	0.95	0.60	1.00	1.00	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.90	0.72	0.95	0.99	1.00	0.94	0.90	0.90	1.00	0.81	0.33
Water Mist	0.70	0.90	0.95	0.60	1.00	1.00	0.80	0.80	1.00	1.00	0.80	0.80	1.00	1.00	0.90	0.90	0.58	0.85	0.90	0.90	0.69	1.00	1.00	0.95	0.95	0.23
AFFF Sprklg	0.70	0.90	0.95	0.60	1.00	1.00	0.80	0.80	1.00	1.00	0.80	0.80	1.00	1.00	0.80	0.80	0.51	0.85	1.00	0.80	0.68	0.90	1.00	0.80	0.72	0.15

Engine Room (3-103-0-E)

Shaded columns are calculated

	dan	nan	san	An	dapf	sapf	capf	fap	dapv	sapv	capv	vap	dapp	sapp	capp	pap	Ap	saa	aaa	daa	Aa	qae	cae	bae	Ae	A
CO2	0.95	0.99	0.95	0.89	1.00	1.00	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.90	0.63	0.90	0.95	1.00	0.86	0.90	0.90	0.90	0.73	0.35
FM-200	0.95	0.99	0.95	0.89	1.00	1.00	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.90	0.63	0.95	0.99	1.00	0.94	0.90	0.90	1.00	0.81	0.43
Water Mist	0.95	0.99	0.95	0.89	1.00	1.00	0.70	0.70	1.00	1.00	0.80	0.80	1.00	1.00	0.90	0.90	0.50	0.85	0.90	0.90	0.69	1.00	1.00	0.95	0.95	0.29
AFFF Sprklg	0.95	0.99	0.95	0.89	1.00	1.00	0.70	0.70	1.00	1.00	0.80	0.80	1.00	1.00	0.80	0.80	0.45	0.85	1.00	0.80	0.68	0.90	1.00	0.80	0.72	0.20

An=dan*nan*san where dan=detection of fire, nan=notification of Bridge, and san=sound the alarm

Ap=fap*vap*cap where fap=secure the fuel supply, vap=secure the ventilation, and cap=secure the electrical power

fap=dapf*sapf*capf where dapf=decide to secure the fuel supply, sapf=start to secure the fuel supply, and capf=complete securing the fuel supply

vap=dapv*sapv*capv where dapv=decide to secure the ventilation, sapv=start to secure the ventilation, and capv=complete securing the ventilation

cap=dapp*sapp*capp where dapp=decide to secure the power, sapp=start to secure the power, and capp=complete securing the power

Aa=saa*aaa*daa where saa=alignment of automated system, aaa=agent discharges from nozzle, and daa=agent discharges on fire

Ae=qae*cae*bae where qae=quantity of agent is adequate, cae=concentration of agent is adequate, and bae=blackout occurs

A=An*Ap*Aa*Ae where An=Notification, Ap=Preparation, Aa=Agent Application, and Ae=Fire Extinguishment

Figure 4.1 RLFs for Alternative Automated Systems in Engine Room (3-103-0-E)

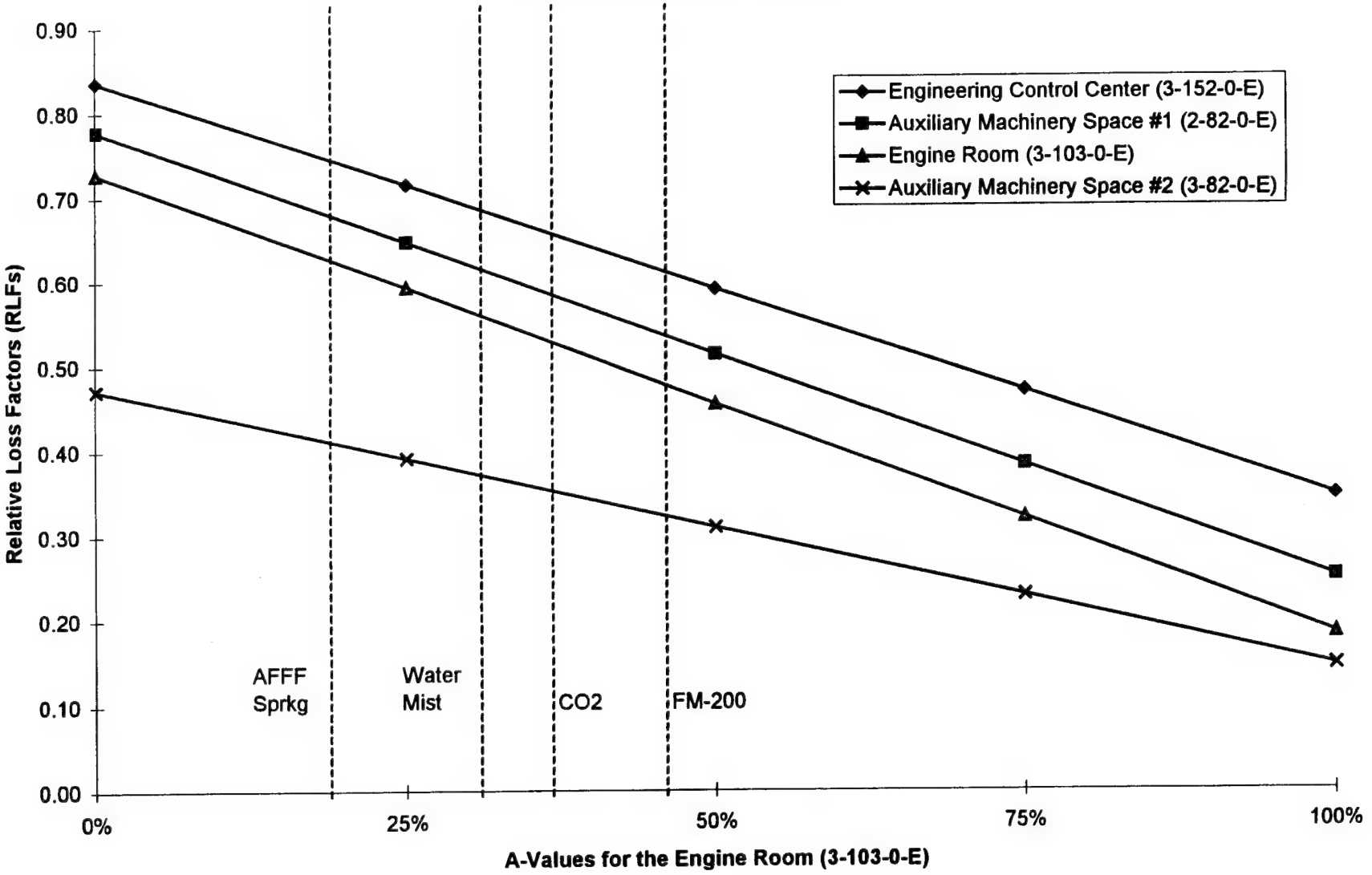


Figure 4.2 RLFs for Alternative Automated Systems in Auxiliary Machinery Space #1 (2-82-0-E)

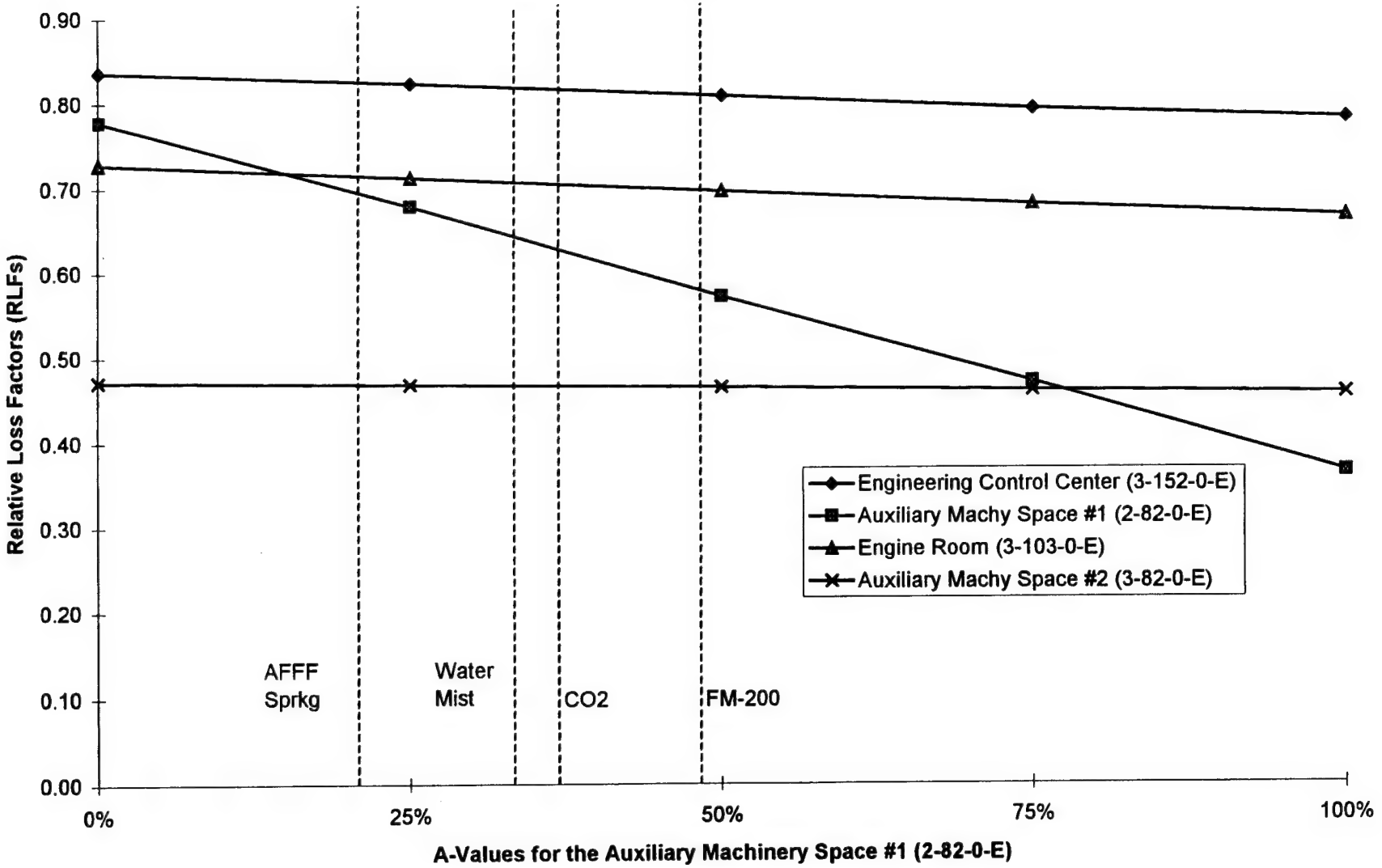
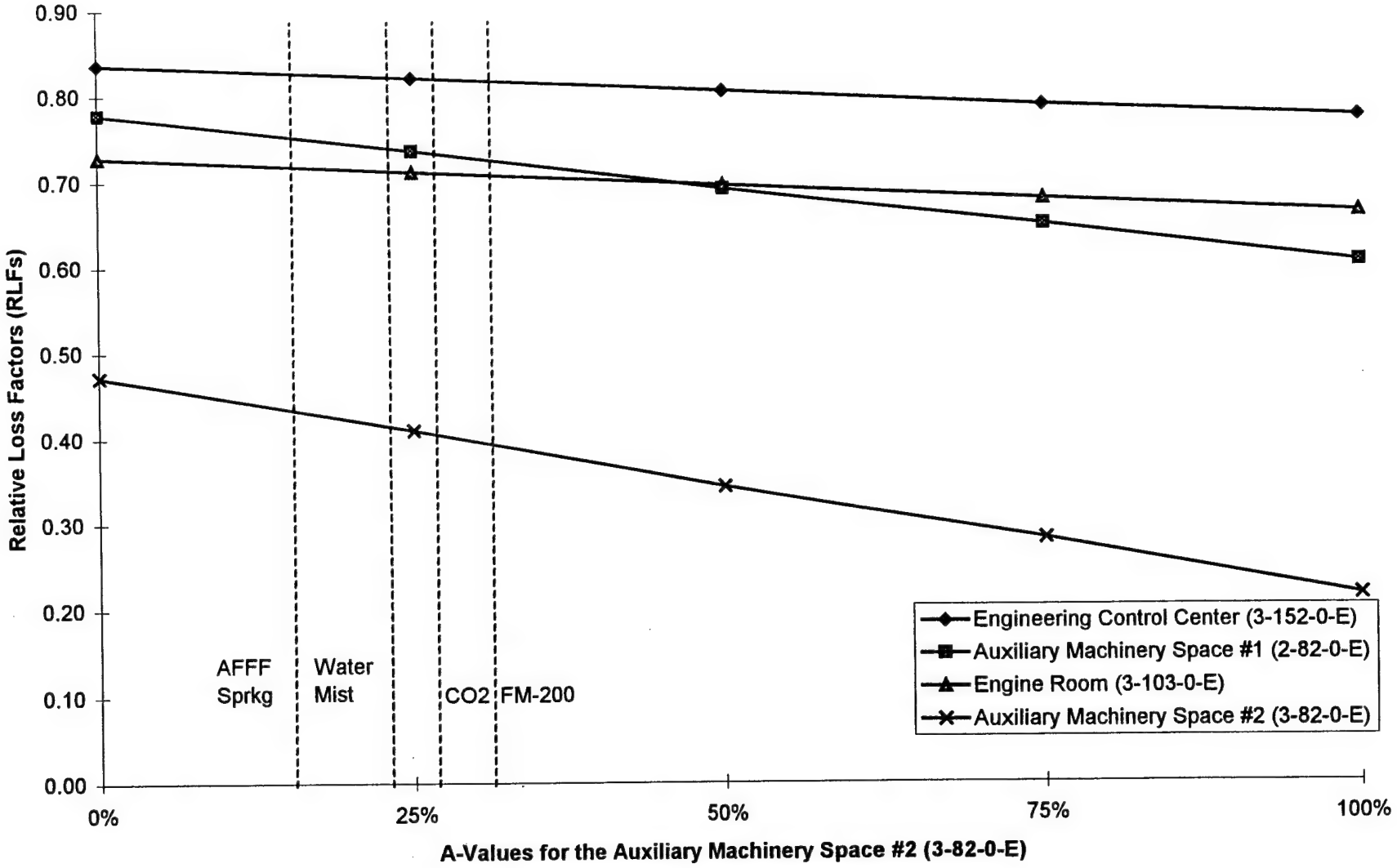


Figure 4.3 RLFs for Alternative Automated Systems in Auxiliary Machinery Space #2 (3-82-0-E)



An analysis of Table 4.4 shows that AFFF sprinkling results in a minimal increase in fire safety (smallest A value) compared to the other alternative systems, whereas the largest increase in fire safety is for FM-200. CO_2, and Water Mist also represent an improvement in the margin of safety presently provided by passive, automated, and manual fire protection systems.

The slope of the lines in Figures 4.1 through 4.3 is a direct indication of the magnitude of improvement in the margin of safety as a result of the appropriate automated suppression system. The steeper the slope, the bigger the increase in overall fire safety levels of the indicated compartment. A minimal increase in the margin of safety is indicated by a nearly horizontal line.

Installing an automated system in the Engine Room results in a significant increase in the margin of safety of all four compartments shown in Figure 4.1. Figure 4.2 shows a significant increase in the margin of safety of Auxiliary Machinery Space #1 (2-82-0-E) with the installation of an automated system in this compartment and only a slight increase in the other compartments. Figure 4.3 shows a significant increase in the margin of safety of both Auxiliary Machinery Spaces by installing an automated System in Auxiliary Machinery Space #2 (3-82-0-E). This is a logical result since fire spreads upwards more rapidly and easily (e.g., from 3-82-0-E to 2-82-0-E) thus protecting the lower space has a beneficial impact on both spaces whereas protecting the upper space has little effect on the lower space. As shown in Figure 4.1, protecting the Engine Room has the most beneficial effect of the three compartments studied. This result reflects the fact that the majority of fires that involve multiple compartments originate in the Engine Room, thus increasing the fire protection in this space has a general beneficial effect on the overall fire safety levels of the cutter. These figures graphically illustrate if only one space in the cutter is protected by an automated system, it should be the Engine Room.

The results of this analysis show that while the installation of an automated system in the Engine Room improves the margin of safety, the Engine Room presently exceeds fire safety objectives without an automated system by relying on existing passive and manual fire protection efforts. Manual fire protection effectiveness is predicated on existing crew levels; a substantial reduction in crew size would require additional analysis to determine the effect on fire safety.

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5. CONCLUSIONS AND RECOMMENDATIONS

The primary objective in this project is to analyze the fire safety of the 270' WMEC. As the sixteenth cutter to be analyzed using the Ship Fire Safety Engineering Methodology (SFSEM) in the past six years, fire safety analysis results for the 270' WMEC may be compared to the results of the ten previously analyzed cutters in the Small Cutter Fire Protection Project, the USCGC VINDICATOR (WMEC 3), 87' Coastal Patrol Boat (CPB), 180' WLB and 225' WLB (R) Seagoing Buoy Tenders, and 210' WMEC Medium Endurance Cutter. [3, 12, 13, 9, 14, 15] Baseline results in previously analyzed cutters indicate that fire protection levels in most compartments, with passive, automated, and manual fire protection features in effect, generally meet Fire Safety Objectives (FSO). Results of the baseline fire safety analysis of the 270' WMEC are consistent with the results discussed in the SCFP, VINDICATOR, CPB, WLB, WLB (R), and 210' WMEC final reports and are in agreement with historical records for fires in U.S. Coast Guard cutters.

The following sections describe the major conclusions and recommendations of the fire safety audit and the baseline fire safety analysis discussed in section 3.0 as well as the analysis of alternatives discussed in section 4.0.

5.1. FIRE SAFETY AUDIT

The following conclusions and recommendations are made in conjunction with the fire safety audit:

- The existing compartmentation appears to be adequate to permit egress from all normally occupied spaces with the exception of the Ordnance Workshop (2-40-1-Q). The "normal" egress from this space is via the escape scuttle into the 76 mm Magazine (1-26-0-M). The normal means of egress is designed to be the watertight door between the Ordnance Workshop and the Passageway (2-28-2-L). However since this door is normally locked with a high security lock on the Passageway side of the door, it is not used as the primary means of egress. Moreover it is likely that the door could not be used in an emergency by personnel trapped in the Ordnance Workshop since the door can not be unlocked from the Ordnance Workshop. Since the Ordnance Workshop is frequently occupied, it would be desirable to have a second means of egress in the event a fire in the Passageway (2-28-2-L) or 76 mm Magazine (1-26-0-M) blocks one egress path. Reconfiguring the lock on this door to permit a normal and alternate means of egress from the Ordnance Workshop, both of which are usable at all times, is considered an important life safety issue and is highly recommended.
- Ionization type smoke detectors are installed throughout the ship in 16 zones; the detection system is not fully addressable. Such a system would indicate the compartment number (or name) instead of merely the zone that is responsible for the alarm. Since the detection system is not fully addressable, an investigation must be made to ascertain which compartment is signaling the alarm if the zone represents multiple compartments. Based on observations during the ship visit, the ship's crew is unaware that some detectors are installed in ventilation ductwork, therefore it is likely that some detectors are not being systematically inspected and maintained unless the shore-based maintenance augmentation team is conducting the required preventive maintenance.

- Based on observations and discussions with the SPENCER crew, it appears that the existing detection system is responsible for frequent false alarms. Failure to believe an actual alarm was partially responsible for a delay in locating a fire that occurred in the Electronic Equipment Space and Storeroom (01-116-0-Q) in February 1994. This costly fire also revealed a problem with compartment names. For example Zone 16 is labeled "Electronic Equipment Space and Storeroom". When the visual and audible alarms indicating Zone 16 activated in this fire, the crew did not immediately associate the alarm with the space they commonly referred to as "ET Stores". This fire was the subject of an extensive investigation and many lessons learned. It would be beneficial for other ships in the 270' WMEC class in particular and the Coast Guard fleet in general to be made aware of lessons learned from all Coast Guard cutter fire investigations.
- The 270' WMEC is equipped with adequate quantities and appropriate types of automated and manual fire extinguishment equipment for responding to fire emergencies in all compartments.
- Smoking is not permitted anywhere inside the ship. The designated smoking area is the weather deck in the vicinity of the fantail. The gasoline storage area is also on the fantail. Changing the designated smoking area to a location on the weather decks well away from gasoline storage areas, pyrotechnics, and ready service ammunition should be considered by the Commanding Officer.
- Numerous compartments on the Second Deck and above contain joiner bulkheads which terminate at the height of the dropped ceiling and are not continuous to the deck above. The dropped ceiling consists of a thin plastic panel with a thin layer of fiberglass glued on the back installed in a light framework. The 1 foot to 2 foot interstitial space created above the dropped ceiling and below the deck above spans an area comprised of several compartments below. This arrangement is conducive for fire and smoke to easily spread to adjacent compartments through the interstitial space. Moreover, many of the compartments containing non-continuous joiner bulkheads are staterooms where crew members may be sleeping.
- Due to the permanent removal of doors, the Crews Mess, Scullery, and Galley are essentially one large compartment for the purposes of fire and smoke movement. This situation prevents isolating the fire to the room of origin and will facilitate the rapid transport of smoke and flames between these spaces. It is suspected that removing these doors is an unauthorized SHIPALT, thus it may be unique to SPENCER and not a class-wide problem.

5.2. BASELINE FIRE SAFETY ANALYSIS

Based on a comprehensive fire safety analysis, all compartments in the 270' WMEC exceed FSOs with passive, automated, and manual fire protection features in effect both in port and at sea. **Manual fire protection must augment passive protection in order for all compartments to exceed FSOs in port and at sea.** The effectiveness of manual fire protection is predicated on the current crew size of 100 and repair party size of 13-15. If there is a substantial decrease in crew size/repair party size, further analysis is warranted to determine the impact on the fire safety of the cutter.

Based on historical records of reported fires for 95% of the Coast Guard fleet over a 60 month period, relatively high fire safety levels are expected in U.S. Coast Guard Medium Endurance Cutters.

Based on a thorough baseline fire safety analysis using the target option as well as the barrier and path options in SAFE, the following additional conclusions and recommendations are offered:

- The most probable rooms of origin for fires that may spread to **involve multiple rooms** are the Engine Room (3-103-0-E), Auxiliary Machinery Space #1 (2-82-0-E), and Auxiliary Machinery Space #2 (3-82-0-E).
- A careful analysis of the results from the various output options in SAFE provided in this report may be effectively used to develop realistic fire scenarios to assist the crew in planning firefighting training.

5.3. ANALYSIS OF ALTERNATIVES

Two issues were studied in the analysis of alternatives phase of this project. First the impact of non-continuous joiner bulkheads on the overall fire safety of the cutter was studied. Second, the impact of various alternative automated systems hypothetically installed in the Engine Room and Auxiliary Machinery Spaces were studied.

5.3.1. NON-CONTINUOUS JOINER BULKHEADS

The following conclusions relative to the non-continuous joiner bulkhead study are based on results shown in Tables 4.1, 4.2, and 4.3:

As expected, the results show that the margin of safety is improved (lower RLFs) by eliminating all non-continuous joiner bulkheads (eliminating their 90% derating). However, improvement is very slight (less than 0.5% in only 6 compartments).

Extending the existing non-continuous joiner bulkheads to the deck above in the 270' WMEC class cutter is not recommended due to the following reasons:

- The cost of retrofitting all non-continuous joiner bulkheads with bulkheads that are continuous to the deck above in all 270' WMEC class cutters is considered substantial.
- Only 6 compartments slightly benefit from the change and these compartments already exceed fire safety objectives with passive, manual, and automated fire protection systems in effect.

5.3.2. ALTERNATIVE AUTOMATED FIRE PROTECTION SYSTEMS

The following conclusions relative to the analysis of alternative automated systems installed in the Engine Room and Auxiliary Machinery Spaces is based on results shown in Table 4.4 and Figures 4.1 through 4.3:

- As shown in Figures 4.1 through 4.3, all compartments in the ship exceed their FSOs for all of the alternative automated systems studied (FM-200, CO_2, Water Mist and AFFF

Sprinkling). Of the systems studied, FM-200 increases the margin of safety the most. Water Mist and CO_2 are also considered more effective than the AFFF system.

- The results of this analysis show that while the installation of an automated system in the Engine Room improves the margin of safety, the Engine Room presently exceeds fire safety objectives without an automated system by relying on existing passive and manual fire protection efforts. Also of importance is that this class of cutter was not designed or constructed to meet current SOLAS/CFR requirements for automated fire protection systems in the Engine Room as some recent Coast Guard cutters have been. These two facts support maintaining the current configuration of Engine Room fire protection features. It is noteworthy that the current practice of installing automated suppression systems in Engine Rooms arises from loss history which indicates that the majority of costly fires originate in Engine Rooms. This is indicative of the substantial threat of a class B fire. Moreover, a large fire in the Engine Room would undoubtedly render the cutter unable to conduct Coast Guard missions for a significant period of time until costly repairs could be accomplished. These potential impacts must be weighed against the relative cost of retrofitting this class of cutters with an automated suppression system in the Engine Room.

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Appendix A
Compartmentation of the 270' WMEC

This appendix includes the plan views of all decks in the 270' WMEC (A-Class) Medium Endurance Cutter. The plan views include the access fittings for each compartment such as doors, scuttles, hatches, and operable windows. The compartmentation shown represents how the ship was modeled in AutoCAD for the fire safety analysis.

Key	Compartment ID	Description	CUI
1	02-48-0-C	Pilothouse	C
2	02-45-0-Q	Fan Space	QF
3	02-55-1-T	Vent Shaft	TH
4	02-65A-4-L	Stairway	LP
5	02-65-2-L	Stairway	LP
6	02-63-2-L	Passageway	LP
7	02-72-2-L	Sanitary Space	LW
8	02-63-0-Q	Sensor Room and Command Support Center	C
9	02-96-0-M	Small Arms Locker	C
10	02-106-2-Q	Stack	TU
11	02-106-0-Q	Elec Equipment Space and Storeroom	QA
12	02-106-1-Q	Stack	TU
13	01-117-0-Q	Helicopter Hanger	QS
14	01-47-1-L	Vestibule	LP
15	01-47-3-L	Sanitary Space	LW
16	01-47-2-L	Exec Officer Stateroom	L1
17	01-47-4-L	Sanitary Space	LW
18	01-47-5-L	CO Stateroom	L1
19	01-55-1-Q	Vent Shaft	TH
20	01-61-1-Q	Void	V
21	01-63-1-Q	AC & WW Trunk	TH
22	01-58-2-L	EO Stateroom	L1
23	01-63A-2-L	Stairway	LP
24	01-52-0-L	Passageway	LP
25	01-61-1-Q	CO Office	QO
26	01-68-4-L	Wardroom Stateroom	L2
27	01-68-2-L	Sanitary Space	LW
28	01-68-0-L	Wardroom Stateroom	L2
29	01-68-0-L	Passageway	LP
30	01-68-3-L	Wardroom Stateroom	L1
31	01-81-1-L	Sanitary Space	LW
32	01-82-1-L	Passenger Stateroom	L1
33	01-84-2-L	Wardroom Stateroom	L2
34	01-89-2-L	Sanitary Space	LW
35	01-94-2-L	Decontamination Shower	LW
36	01-85-0-L	Wardroom Stateroom	L2
37	01-98-0-L	Passageway	LP
38	01-98-0-L	Passageway	LP
39	01-98-0-L	Passageway	LP
40	01-94-1-Q	Winch Mach. Space	QA
41	01-103-2-Q	Machinery Vent Plenum Compartment	TH
42	01-109-2-Q	Uptake	TU
43	01-103-0-Q	Avionics Shop	QS
44	01-103-1-Q	Machinery Vent Plenum Compartment	TH
45	01-110-1-Q	Uptake	TU
46	1-5-0-K	Flammable Liquids Storeroom	K
47	1-12-0-Q	Anchor Windlass Room and Bosun's Workshop	QS
48	1-26-2-L	Passageway	LP
49	1-26-1-C	Gun Control Booth	C
50	1-26-0-M	Magazine	M

Key	Compartment ID	Description	CUI
51	1-43-2-Q	Fan Room	QF
52	1-47-1-Q	Laundry	QL
53	1-53-1-Q	Movie Locker	QG
54	1-56-1-Q	Locker	QG
55	1-51-2-L	Sanitary Space	LW
56	1-47-0-L	Passageway	LP
57	1-55-1-Q	Vent Shaft	TH
58	1-61-1-Q	Void	V
59	1-63-1-Q	AC & WW Trunk	TH
60	1-62-2-Q	Sea Bag Locker	AG
61	1-62-2-L	Stairway	LP
62	1-65-2-Q	Foul Weather and Life Vest Locker	AG
63	1-58-1-L	Crews Locker Space	AS
64	1-63-0-L	Passageway	LP
65	1-61-2-L	Crews Berthing	L5
66	1-73-1-Q	Engineers Office	QO
67	1-82-2-Q	Forward Repair Locker #2	QS
68	1-82-3-Q	Ship and Supply Office	QO
69	1-90-2-Q	Electricians Workshop	QS
70	1-82-1-L	Passageway	LP
71	1-82-4-Q	Engineers Workshop	QS
72	1-95-1-Q	Life Jacket Locker	AG
73	1-95-1-L	Stairway	LP
74	1-96-1-L	Passageway	LP
75	1-103-4-A	Engineers Tool Room	AS
76	1-109-2-Q	Uptake	TU
77	1-103-2-L	Vestibule	LP
78	1-113-2-L	Passageway	LP
79	1-103-1-L	Passageway	LP
80	1-110-1-Q	Uptake	TU
81	1-103-3-A	Electronic Stores	AS
82	1-117-1-Q	Fan Room	QF
83	1-117-3-Q	Recreation Locker	AG
84	1-117-2-L	Wardroom	LL
85	1-121-2-Q	Ship Stores	QO
86	1-129-2-Q	Scullery	QG
87	1-117-0-L	Crews Mess	LL
88	1-141-2-Q	Galley	QG
89	1-165-4-L	CPO Stateroom	L2
90	1-165-2-L	CPO Stateroom	L2
91	3-165-1-Q	Service Elevator Trunk	TH
92	1-169-1-L	Medical Stores	AS
93	1-165-0-L	Passageway	LP
94	1-165-3-L	CPO Lounge	LL
95	1-179-1-L	Dispensary	AS
96	1-174-2-L	Sanitary Space	LW
97	1-177-0-L	CPO Stateroom	L2
98	1-186-4-L	Sanitary Space	LW
99	1-186-2-Q	Computer Room	QA
100	1-186-0-A	Engineers Stores	AS

Key	Compartment ID	Description	CUI
101	1-186-3-Q	Trash Compactor Space	QG
102	1-186-0-L	Passageway	LP
103	1-199-2-L	CPO Stateroom	L2
104	1-199-0-L	CPO Stateroom	L2
105	1-205-1-Q	Foul Weather and Life Vest Locker	AG
106	1-201-1-Q	Life Jacket Locker	AG
107	1-207-2-Q	Fan Room	QF
108	1-207-1-L	Vestibule	LP
109	1-207-3-J	JP-5 Fueling	AG
110	2-17-0-A	Bosun Stores	AS
111	2-26A-0-A	Storerooms	AS
112	2-40-1-Q	Ordinance Workshop	QA
113	2-47-0-L	Crews Berthing	L5
114	2-47-1-C	IC Room	C
115	2-59-4-L	Crews Locker Space	AS
116	2-59-2-L	Sanitary Space	LW
117	2-64-2-L	Stairway	LP
118	2-56-0-L	Passageway	LP
119	2-58-1-C	WW & AC Trunk	TH
120	2-58-1-L	Sanitary Space	LW
121	2-64-1-L	Crews Locker Space	AS
122	2-72-2-L	Crews Lounge	LL
123	2-75-0-L	Sanitary Space	LW
124	2-80-1-Q	Cleaning Gear Locker	AG
125	2-66-1-L	Crews Berthing	L5
126	2-82-0-E	AMS No 1	QA
127	2-95-1-L	Stairway	LP
128	3-103-0-E	Engine Room	EM
129	3-152-2-E	Engineers Workspace	QS
130	3-152-0-E	Engineering Control Center	C
131	3-165-1-Q	Service Elevator Trunk	TH
132	2-165-1-Q	Sea Bag Locker	AG
133	2-165-0-L	Sanitary Space	LW
134	2-165-2-L	Crews Lounge	LL
135	2-175-0-L	Crew Locker Space	AS
136	2-178-1-L	Stairway	LP
137	2-165-3-L	Crew Berthing Area	L5
138	2-186-2-Q	Sea Bag Locker	AG
139	2-186-4-L	Crew Berthing Area	L5
140	2-186-0-L	Sanitary Space	LW
141	2-186-1-L	Crews Lounge	LL
142	2-199-1-L	Stairway	LP
143	2-194-0-L	Crew Locker Space	AS
144	2-207-1-Q	Fan Room	QF
145	2-210-1-L	Stairway	LP
146	2-214-2-M	Small Arms Magazine	M
147	2-207A-0-A	Storage Area	AS
148	2-221-1-Q	Aft Repair #3	QF
149	3-228-0-E	Steering Gear Room	QA
150	3-26A-0-A	Stores	AS

Compartmentation Key

Key	Compartment ID	Description	CUI
151	3-47-0-C	Communications Center	C
152	3-62-2-L	Stairway	LP
153	3-77-0-W	Water	W
154	3-82-0-E	Auxilary Machine Space #2	QA
155	3-94-1-L	Stairway	LP
156	3-152A-0-E	Engine Room Ext	EM
157	4-165-4-F	Diesel Oil Tank	F
158	4-65-1-F	Fuel Tank	F
159	3-169-2-A	Storeroom	AG
160	3-175-0-A	Refrigerated Stores	AR
161	4-186-0-J	JP-5 Pump Room	QA

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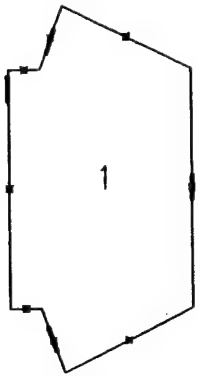

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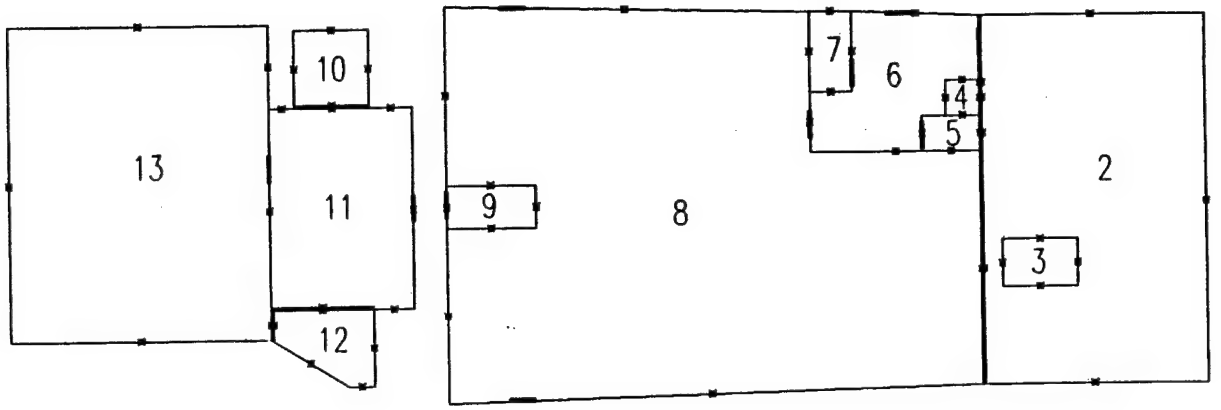

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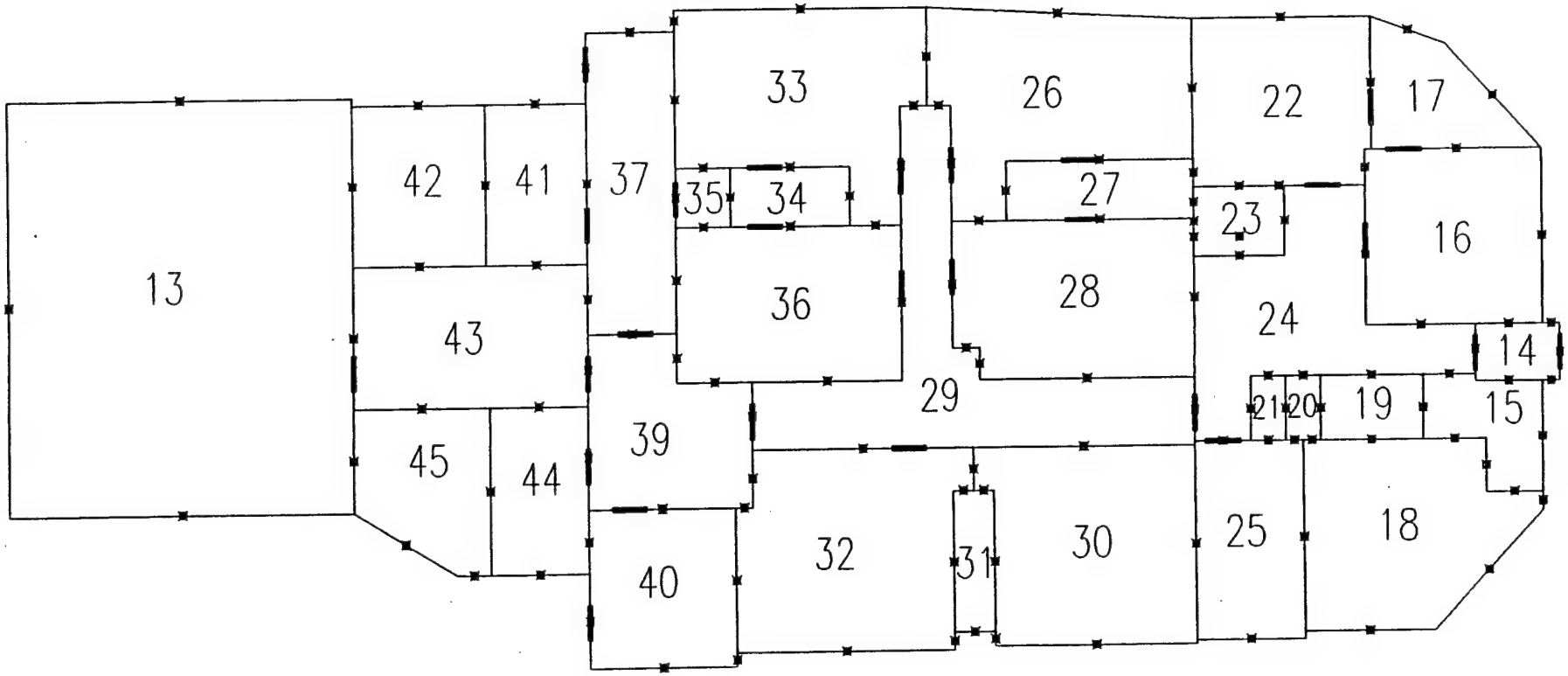
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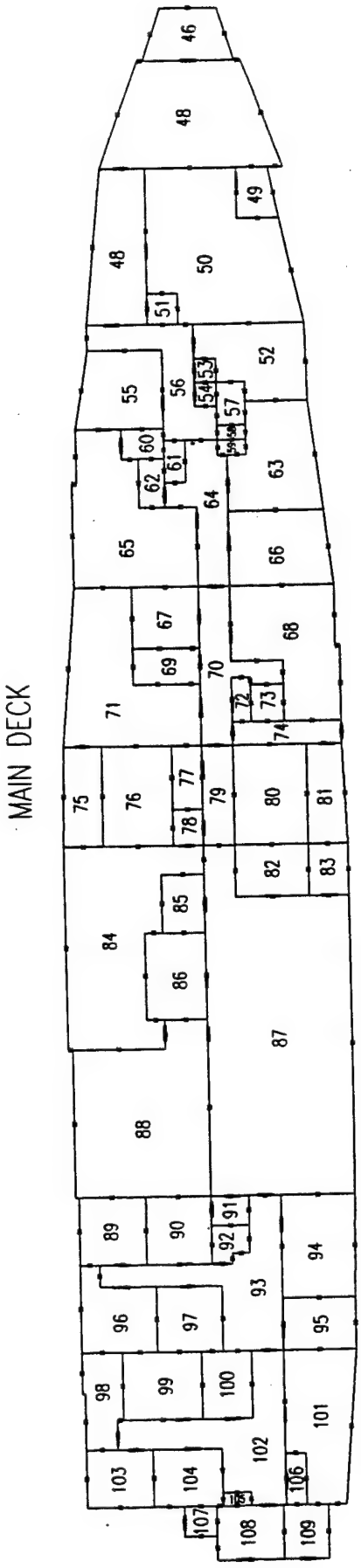
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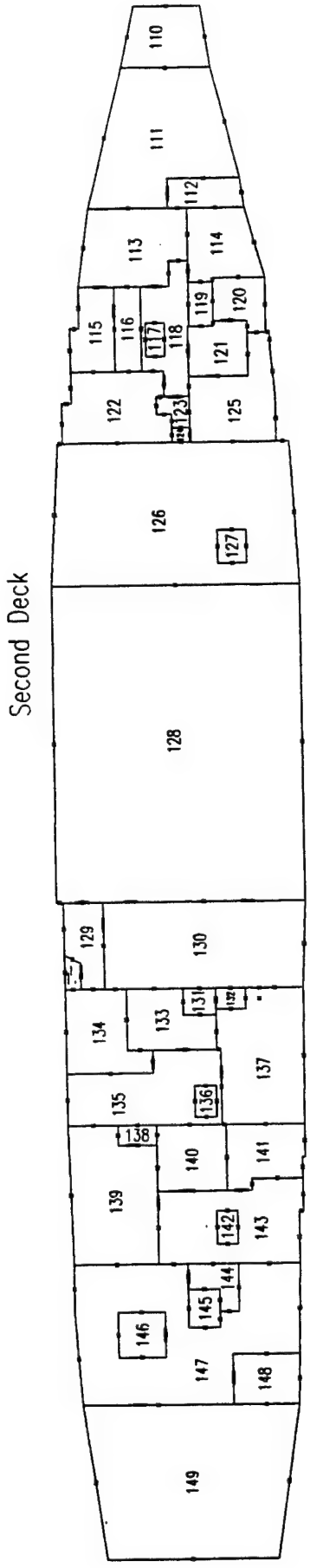
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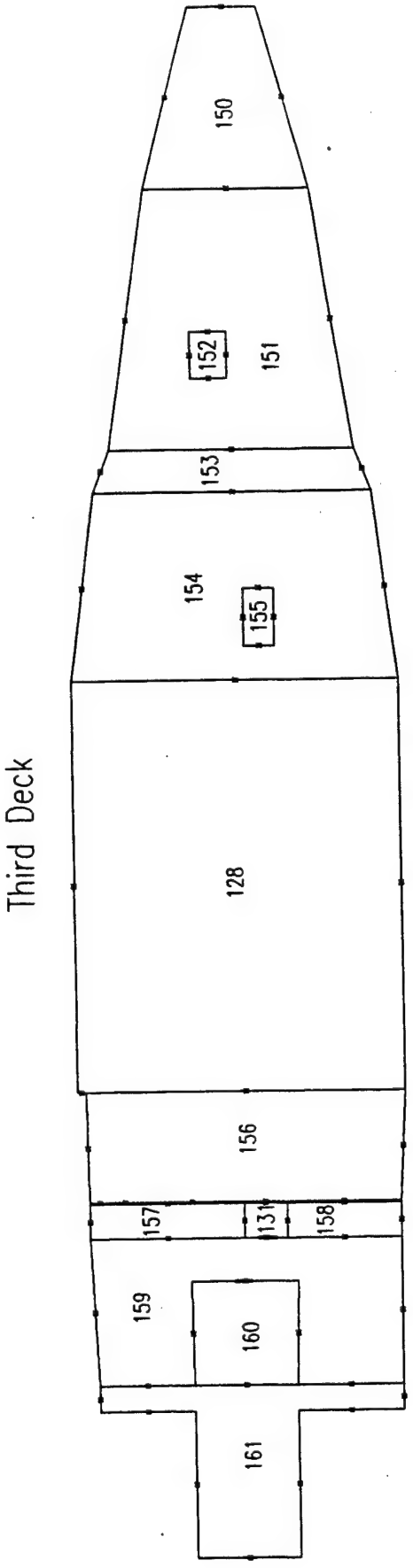
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Appendix B
SAFE Input Data for the 270' WMEC Baseline Fire Safety Analysis

The various input data required to perform the baseline fire safety analysis on the 270' WMEC using SAFE, version 2.2, are documented in this appendix. The following is an index of the tables and attachments contained in this appendix:

Table B.1.1 Compartment Height and Deck Area

Plan ID	Compartment Name	Height (ft)	Area (sq ft)
CUI=AG	(Gear Locker)		
1-56-1-Q	LOCKER	8	9
1-62-2-Q	SEABAG LKR	8	22.4
1-65-2-Q	FOUL WEATHER AND LIFE VEST LKR	8	21.8
1-95-1-Q	LIFE JACKET LOCKER	8	14.4
1-117-3-Q	RECREATION LKR	8	37.4
1-201-1-Q	LIFE JACKET LCKR	8	18.2
1-205-1-Q	FOUL WEATHER LIFE VEST LKR	8	6.5
2-80-1-Q	CG LKR	8	5.7
2-165-1-Q	SEABAG LKR	8	14.1
2-186-2-Q	SEA BAG LKR	8	17.4
CUI=AR	(Refrigerated Storage)		
3-175-0-A	REFRIGERATED STORES	7	141.6
CUI=AS	(Storeroom)		
1-53-1-Q	MOVIE LKR	8	9
1-58-1-L	CREWS LOCKER SPACE	8	147.7
1-103-3-A	ELECTRONIC STORES	8	67.6
1-103-4-A	ENGINEERS TOOL RM	8	70.4
1-121-2-Q	SHIP STORES	8	44.8
1-169-1-L	MEDICAL STORES	8	21.9
1-186-0-A	ENGINEERS STORES	8	58.9
02-106-0-Q	ELEC EQPT SPACE AND STRM	12.2	168
3-26A-0-A	STORES	6.5	266.2
3-169-2-A	STOREROOM	7	443.2
2-26A-0-A	STOREROOMS	8	332.4
2-17-0-A	BOSUN STORES	8	105.8
2-59-4-L	CREWS LOCKER SPACE	8	74.5
2-64-1-L	CREWS LOCKER SPACE	8	69.1
2-175-0-L	CREW LOCKER SPACE	8	203
2-194-0-L	CREW LOCKER SPACE	8	226.8
2-207A-0-A	STORAGE AREA	8	534.2
CUI=C	(Ship Control/Communications)		
1-26-1-C	GUN CONTROL BOOTH	8	32
02-63-0-Q	SENSOR ROOM AND COMMAND SUPPORT CENTER	8	1021.4
02-48-0-C	PILOTHOUSE	8	312.2
3-47-0-C	COMMUNICATIONS CENTER	6.5	659.4
2-47-1-C	IC ROOM	8	104.1
3-152-0-E	ENGINEERING CONTROL CENTER	9.5	389.4
CUI=EM	(Main Propulsion - Mechanical)		
3-103-0-E	ENGINE ROOM	18	1773.9
3-152A-0-E	ENGINE ROOM EXT	8.5	464.6
CUI=K	(Hazardous Material Storage)		
1-5-0-K	FLAMMABLE LIQ. STOREROOM	8	67.2
CUI=L1	(Senior Officer's Cabin)		
01-47-2-L	XO STATEROOM	8	100
01-47-5-L	CO STATEROOM	8	116.2

Plan ID	Compartment Name	Height	Area
		(ft)	(sq ft)
01-58-2-L	EO STATEROOM	8	97.1
01-68-3-L	WARDROOM STATEROOM	8	132.8
01-82-1-L	PASSENGER STATEROOM	8	145.6
CUI=L2	(Officer/CPO Quarters)		
1-165-2-L	CPO STATEROOM	8	79.1
1-165-4-L	CPO STATEROOM	8	81
1-177-0-L	CPO STATEROOM	8	75.7
1-199-0-L	CPO STATEROOM	8	70.2
1-199-2-L	CPO STATEROOM	8	68.6
01-68-4-L	WARDROOM STATEROOM	8	135.8
01-84-2-L	WARDROOM STATEROOM	8	138
01-85-0-L	WARDROOM STATEROOM	8	116.2
CUI=L5	(Crews Berthing)		
1-61-2-L	CREWS BERTHING	8	249
2-47-0-L	CREWS BERTHING	8	168
2-66-1-L	CREWS BERTHING	8	144.3
2-165-3-L	CREW BERTHING AREA	8	259.7
2-186-4-L	CREW BERTHING	8	253.5
CUI=LL	(Wardroom/Mess/Lounge Areas)		
1-117-0-L	CREW MESS	8	787.7
1-117-2-L	WARDROOM	8	352
1-165-3-L	CPO LOUNGE	8	133
2-72-2-L	CREWS LOUNGE	8	155.8
2-165-2-L	CREWS LOUNGE	8	130.7
2-186-1-L	CREW LOUNGE	8	98.7
CUI=LM	(Medical/Dental Spaces)		
1-179-1-L	DISPENSARY	8	65.8
CUI=LP	(Passageway/Staircase/Vestibule)		
1-26-2-L	PASSAGEWAY	8	145.6
1-47-0-L	PASSAGEWAY	8	111.7
1-62-2-L	STAIRWAY	8	15.7
1-63-0-L	PASASGEWAY	8	95.7
1-82-1-L	PASSAGEWAY	8	104.3
1-95-1-L	STAIRWAY	8	21
1-96-1-L	PASSAGEWAY	8	44.8
1-103-1-L	PASSAGEWAY	8	55.2
1-103-2-L	VESTIBULE	8	35.2
1-113-2-L	PASSAGEWAY	8	20
1-165-0-L	PASSAGEWAY	8	181.8
1-186-0-L	PASSAGEWAY	8	183.3
1-207-1-L	VESTIBULE	8	61.9
01-63A-2-L	STAIRWAY	8	20.8
01-47-1-L	VESTIBULE	8	15.4
01-52-0-L	PASSAGEWAY	8	134.7
01-68-0-L	PASSAGEWAY	8	147.7
01-98-0-L	PASSAGEWAY	8	89.4
02-65A-4-L	STAIRWAY	8	6.8
02-63-2-L	PASSAGEWAY	8	112

Plan ID	Compartment Name	Height	Area
		(ft)	(sq ft)
02-65-2-L	STAIRWAY	8	11.4
3-62-2-L	STAIRWAY	6.5	21.6
3-94-1-L	STAIRWAY	6.5	22.4
2-56-0-L	PASSAGEWAY	8	97.2
2-64-2-L	STAIRWAY	8	14
2-95-1-L	STAIRWAY	8	21
2-178-1-L	STAIRWAY	8	15.4
2-199-1-L	STAIRWAY	8	15
2-210-1-L	STAIRWAY	8	26.7
CUI=LW	(Sanitary Spaces)		
1-51-2-L	SANITARY SPACE	8	113.4
1-174-2-L	SANITARY SPACE	8	95.8
1-186-4-L	SANITARY SPACE	8	65
01-47-3-L	SANITARY SPACE	8	32.6
01-47-4-L	SANITARY SPACE	8	44.8
01-68-2-L	SANITARY SPACE	8	36.7
01-81-1-L	SANITARY SPACE	8	19.2
01-89-2-L	SANITARY SPACE	8	23.8
01-94-2-L	DECONTAMINATION SHOWER	8	10.9
02-72-2-L	SANITARY SPACE	8	19.2
2-58-1-L	SANITARY SPACE	8	53.3
2-59-2-L	SANITARY SPACE	8	50.4
2-75-0-L	SANITARY SPACE	8	17.7
3-160-2-L	SANITARY SPACE	9.5	11
2-165-0-L	SANITARY SPACE	8	104.9
2-186-0-L	SANITARY SPACE	8	102
CUI=QA	(Aux Machinery Spaces)		
1-186-2-Q	COMPUTER ROOM	8	95.7
1-207-3-J	JP-5 FUELING	8	41.8
01-94-1-Q	WINCH MACH. SPACE	8	77.4
3-82-0-E	AUXILIARY MACHINE SPACE NO. 2	6.5	696.6
4-186-0-J	JP-5 PUMP ROOM	7	299.2
2-82-0-E	AMS NO 1	8	732.3
3-228-0-E	STEERING GEAR ROOM	8	661.2
CUI=QF	(Fan Room)		
1-43-2-Q	FAN ROOM	8	16.8
1-117-1-Q	FAN ROOM	8	67.7
1-207-2-Q	FAN ROOM	8	16.8
02-45-0-Q	FAN SPACE	3	453.8
2-207-1-Q	FAN ROOM	8	37.6
CUI=QG	(Galley/Pantry/Scullery)		
1-129-2-Q	SCULLERY	8	96
1-141-2-Q	GALLEY	8	378.4
1-186-3-Q	TRASH COMPACTOR SPACE	8	162.4
CUI=QL	(Laundry)		
1-47-1-Q	LAUNDRY	8	123.1
CUI=QO	(Office Spaces)		
1-73-1-Q	ENGINEERS OFFICE	8	125.4

Plan ID	Compartment Name	Height	Area
		(ft)	(sq ft)
1-82-3-Q	SHIP AND SUPPLY OFFICE	8	195.8
01-61-1-Q	CO OFFICE	8	69.4
CUI=QS	(Shops)		
1-12-0-Q	ANCHOR WINDLASS RM AND BOSUN'S WORKSHOP	8	264.1
1-82-2-Q	FORWARD REPAIR #2	8	72.2
1-82-4-Q	ENGINEERS WORKSHOP	8	255.8
1-90-2-Q	ELCTRICIANS WORKSHOP	8	42.2
01-103-0-Q	AVIONICS SHOP	8	110.4
2-40-1-Q	ORDNANCE WORKSHOP	8	48
3-152-2-E	ENGINEERS WORK SPACE	9.5	65.5
2-221-1-Q	AFT REPAIR #3	8	73.7
CUI=TH	(Trunks/Hoists/Dumbwaiters)		
1-55-1	VENT SHAFT	8	20.9
1-63-1	AC&WW TRUNK	8	7.2
3-165-1-Q	SERVICE ELEVATOR TRUNK	8	19.2
01-55-1	VENT SHAFT	8	20.9
01-63-1	AC & WW TRUNK	8	7.2
01-103-1-Q	MACHINERY VENT PLENUM COMPT	8	54.5
01-103-2-Q	MACHINERY VENT PLENUM COMPT	8	55.2
02-55-1	VENT SHAFT	3	20.9
2-58-1	WW & AC TRUNK	8	23.8
CUI=TU	(Stacks/Engine Uptakes)		
1-109-2	UPTAKE	8	127
1-110-1	UPTAKE	8	129.7
01-109-2	UPTAKE	8	71.8
01-110-1	UPTAKE	8	64.4
02-106-1-Q	STACK	20	35.6
02-106-2-Q	STACK	20	33.6
CUI=V	(Voids/Cofferdams)		
1-61-1	VOID	8	7.2
01-61-1	VOID	8	7.2
CUI=W	(Water Tank (empty))		
3-77-0-W	WATER	6.5	139.2

Table B.1.2 Ventilation Openings: Area and Average Height

Plan ID	Compartment Name	# Vents	H/V	Area (In2)	Height (In.)	Total Area (In2)	Avg.Height (In.)
CUI=AG	(Gear Locker)						
1-56-1-Q	LOCKER					169	13
		1	V	169	13		
1-62-2-Q	SEABAG LKR					169	13
		1	V	169	13		
1-65-2-Q	FOUL WEATHER AND LIFE VEST LKR					169	13
		1	V	169	13		
1-95-1-Q	LIFE JACKET LOCKER					0	0
1-117-3-Q	RECREATION LKR					0	0
1-201-1-Q	LIFE JACKET LCKR					169	13
		1	V	169	13		
1-205-1-Q	FOUL WEATHER LIFE VEST LKR					169	13
		1	V	169	13		
2-80-1-Q	CG LKR					169	13
		1	V	169	13		
2-165-1-Q	SEABAG LKR					0	0
2-186-2-Q	SEA BAG LKR					0	0
CUI=AR	(Refrigerated Storage)						
3-175-0-A	REFRIGERATED STORES					0	0
CUI=AS	(Storeroom)						
1-53-1-Q	MOVIE LKR					169	13
		1	V	169	13		
1-58-1-L	CREWS LOCKER SPACE					144	24
		1	V	144	24		
1-103-3-A	ELECTRONIC STORES					0	0
1-103-4-A	ENGINEERS TOOL RM					0	0
1-121-2-Q	SHIP STORES					25	96
		1	H	25	96		
1-169-1-L	MEDICAL STORES					169	13
		1	V	169	13		
1-186-0-A	ENGINEERS STORES					41	3
		1	V	32	4		
		1	V	9	3		
02-106-0-Q	ELEC EQPT SPACE AND STRM					324	76
		1	V	36	6		
		1	H	288	146		
3-26A-0-A	STORES					32	78
		2	H	16	78		
3-169-2-A	STOREROOM					50	5
		2	V	25	5		
2-26A-0-A	STOREROOMS					0	0
2-17-0-A	BOSUN STORES					16	4
		1	V	16	4		
2-59-4-L	CREWS LOCKER SPACE					157	38
		1	V	40	8		
		1	V	72	12		

Plan ID	Compartment Name	#		Area	Height	Total Area	Avg.Height
		Vents	H/V	(In2)	(In.)	(In2)	(In.)
		1	H	45	96		
2-64-1-L	CREWS LOCKER SPACE					34	96
		1	H	25	96		
		1	H	9	96		
2-175-0-L	CREW LOCKER SPACE					672	35
		2	V	168	24		
		2	V	119	17		
		1	H	98	96		
2-194-0-L	CREW LOCKER SPACE					597	34
		3	V	119	17		
		1	V	168	24		
		1	H	72	96		
2-207A-0-A	STORAGE AREA					0	0
CUI=C	(Ship Control/Communications)						
1-26-1-C	GUN CONTROL BOOTH					9	96
		1	H	9	96		
02-63-0-Q	SENSOR ROOM AND COMMAND SUPPORT CENTER					0	0
02-48-0-C	PILOTHOUSE					0	0
3-47-0-C	COMMUNICATIONS CENTER					205	53
		1	V	25	5		
		2	H	90	78		
2-47-1-C	IC ROOM					463	48
		1	V	175	25		
		1	V	168	24		
		1	H	120	96		
3-152-0-E	ENGINEERING CONTROL CENTER					40	5
		1	V	16	4		
		1	V	24	6		
CUI=EM	(Main Propulsion - Mechanical)						
3-103-0-E	ENGINE ROOM					1600	40
		1	V	1600	40		
3-152A-0-E	ENGINE ROOM EXT					0	0
CUI=K	(Hazardous Material Storage)						
1-5-0-K	FLAMMABLE LIQ. STOREROOM					75	15
		1	V	75	15		
CUI=L1	(Senior Officer's Cabin)						
01-47-2-L	XO STATEROOM					150	30
		3	V	40	8		
		1	H	30	96		
01-47-5-L	CO STATEROOM					81	52
		1	V	56	8		
		1	H	25	96		
01-58-2-L	EO STATEROOM					185	51
		1	V	21	7		
		1	V	56	8		
		1	H	72	96		
		1	H	36	96		

Plan ID	Compartment Name	#		Area	Height	Total Area	Avg.Height
		Vents	H/V	(In2)	(In.)	(In2)	(In.)
01-68-3-L	WARDROOM STATEROOM					91	36
		1	V	40	8		
		1	V	15	5		
		1	H	36	96		
01-82-1-L	PASSENGER STATEROOM					93	36
		1	V	40	8		
		1	V	18	6		
		1	H	35	96		
CUI=L2	(Officer/CPO Quarters)						
1-165-2-L	CPO STATEROOM					121	54
		1	V	91	13		
		1	H	30	96		
1-165-4-L	CPO STATEROOM					121	54
		1	V	91	13		
		1	H	30	96		
1-177-0-L	CPO STATEROOM					121	54
		1	V	91	13		
		1	H	30	96		
1-199-0-L	CPO STATEROOM					121	54
		1	V	91	13		
		1	H	30	96		
1-199-2-L	CPO STATEROOM					121	54
		1	V	91	13		
		1	H	30	96		
01-68-4-L	WARDROOM STATEROOM					44	50
		1	V	20	5		
		1	H	24	96		
01-84-2-L	WARDROOM STATEROOM					107	54
		1	V	72	12		
		1	H	35	96		
01-85-0-L	WARDROOM STATEROOM					153	57
		1	V	126	18		
		1	H	27	96		
CUI=L5	(Crews Berthing)						
1-61-2-L	CREWS BERTHING					337	36
		2	V	84	7		
		1	H	169	96		
2-47-0-L	CREWS BERTHING					348	60
		1	V	312	24		
		1	H	36	96		
2-66-1-L	CREWS BERTHING					530	46
		1	V	91	13		
		1	V	119	17		
		1	V	40	8		
		2	H	140	96		
2-165-3-L	CREW BERTHING AREA					557	58
		1	V	119	17		

Plan ID	Compartment Name	#		Area	Height	Total Area	Avg.Height
		Vents	H/V	(In2)	(In.)	(In2)	(In.)
		1	V	168	24		
		1	H	120	96		
		1	H	150	96		
2-186-4-L	CREW BERTHING					596	32
		2	V	147	21		
		2	V	91	13		
		1	H	120	96		
CUI=LL	(Wardroom/Mess/Lounge Areas)						
1-117-0-L	CREW MESS					918	18
		1	V	775	25		
		1	V	143	11		
1-117-2-L	WARDROOM					744	72
		1	V	624	24		
		2	H	60	96		
1-165-3-L	CPO LOUNGE					228	60
		1	V	168	24		
		1	H	60	96		
2-72-2-L	CREWS LOUNGE					179	56
		1	V	119	17		
		1	H	60	96		
2-165-2-L	CREWS LOUNGE					228	60
		1	V	168	24		
		1	H	60	96		
2-186-1-L	CREW LOUNGE					213	60
		1	V	168	24		
		1	H	45	96		
CUI=LM	(Medical/Dental Spaces)						
1-179-1-L	DISPENSARY					119	17
		1	V	119	17		
CUI=LP	(Passageway/Staircase/Vestibule)						
1-26-2-L	PASSAGEWAY					0	0
1-47-0-L	PASSAGEWAY					651	15
		4	V	91	13		
		1	V	119	17		
		1	V	168	24		
1-62-2-L	STAIRWAY					182	13
		2	V	91	13		
1-63-0-L	PASASGEWAY					182	13
		2	V	91	13		
1-82-1-L	PASSAGEWAY					105	36
		1	V	30	6		
		1	V	40	8		
		1	H	35	96		
1-95-1-L	STAIRWAY					310	55
		1	H	15	96		
		1	H	85	96		
		1	V	91	13		

Plan ID	Compartment Name	#		Area	Height	Total Area	Avg.Height
		Vents	H/V	(In2)	(In.)	(In2)	(In.)
		1	V	119	17		
1-96-1-L	PASSAGEWAY					0	0
1-103-1-L	PASSAGEWAY					0	0
1-103-2-L	VESTIBULE					161	23
		1	V	161	23		
1-113-2-L	PASSAGEWAY					200	10
1-165-0-L	PASSAGEWAY					1148	23
		6	V	91	13		
		1	V	168	24		
		1	V	119	17		
		1	H	315	96		
1-186-0-L	PASSAGEWAY					1058	25
		5	V	91	13		
		1	V	119	17		
		1	H	484	96		
1-207-1-L	VESTIBULE					85	54
		1	V	60	12		
		1	H	25	96		
01-63A-2-L	STAIRWAY					200	10
01-47-1-L	VESTIBULE					25	5
		1	V	25	5		
01-52-0-L	PASSAGEWAY					1143	60
		1	V	72	12		
		1	V	273	39		
		1	H	783	96		
		1	H	15	96		
01-68-0-L	PASSAGEWAY					343	23
		1	V	273	39		
		1	V	70	7		
01-98-0-L	PASSAGEWAY					0	0
02-65A-4-L	STAIRWAY					116	9
		1	V	91	13		
		1	V	25	5		
02-63-2-L	PASSAGEWAY					0	0
02-65-2-L	STAIRWAY					200	10
3-62-2-L	STAIRWAY					200	10
3-94-1-L	STAIRWAY					200	10
2-56-0-L	PASSAGEWAY					873	18
		3	V	168	24		
		2	V	119	17		
		1	V	40	8		
		1	V	91	13		
2-64-2-L	STAIRWAY					200	10
2-95-1-L	STAIRWAY					200	10
2-178-1-L	STAIRWAY					200	10
2-199-1-L	STAIRWAY					200	10
2-210-1-L	STAIRWAY					200	10

Plan ID	Compartment Name	#		Area	Height	Total Area	Avg.Height
		Vents	H/V	(In2)	(In.)	(In2)	(In.)
CUI=LW	(Sanitary Spaces)						
1-51-2-L	SANITARY SPACE					184	40
		1	V	72	12		
		1	V	91	13		
		1	H	21	96		
1-174-2-L	SANITARY SPACE					144	11
		1	V	119	17		
		1	V	25	5		
1-186-4-L	SANITARY SPACE					141	68
		1	V	91	13		
		2	H	25	96		
01-47-3-L	SANITARY SPACE					200	10
01-47-4-L	SANITARY SPACE					62	36
		1	V	32	8		
		1	V	18	6		
		1	H	12	96		
01-68-2-L	SANITARY SPACE					33	36
		2	V	12	6		
		1	H	9	96		
01-81-1-L	SANITARY SPACE					39	51
		1	V	30	6		
		1	H	9	96		
01-89-2-L	SANITARY SPACE					39	51
		1	V	30	6		
		1	H	9	96		
01-94-2-L	DECONTAMINATION SHOWER					0	0
02-72-2-L	SANITARY SPACE					112	54
		1	V	91	13		
		1	H	21	96		
2-58-1-L	SANITARY SPACE					117	54
		1	V	72	12		
		1	H	45	96		
2-59-2-L	SANITARY SPACE					90	68
		1	V	72	12		
		2	H	9	96		
2-75-0-L	SANITARY SPACE					49	52
		1	V	40	8		
		1	H	9	96		
3-160-2-L	SANITARY SPACE					18	114
		2	H	9	114		
2-165-0-L	SANITARY SPACE					59	35
		2	V	25	5		
		1	H	9	96		
2-186-0-L	SANITARY SPACE					119	17
		1	V	119	17		
CUI=QA	(Aux Machinery Spaces)						
1-186-2-Q	COMPUTER ROOM					154	4

Plan ID	Compartment Name	#		Area	Height	Total Area	Avg.Height
		Vents	H/V	(In2)	(In.)	(In2)	(In.)
		1	V	42	6		
		7	V	16	4		
1-207-3-J	JP-5 FUELING					150	50
01-94-1-Q	WINCH MACH. SPACE					9	3
		1	V	9	3		
3-82-0-E	AUXILIARY MACHINE SPACE NO. 2					364	21
		4	V	49	7		
		1	H	168	78		
4-186-0-J	JP-5 PUMP ROOM					80	84
		1	H	80	84		
2-82-0-E	AMS NO 1					203	51
		2	V	49	7		
		1	H	15	96		
		1	H	90	96		
3-228-0-E	STEERING GEAR ROOM					763	55
		1	V	234	18		
		2	V	169	13		
		2	H	64	96		
		1	H	63	96		
CUI=QF	(Fan Room)						
1-43-2-Q	FAN ROOM					0	0
1-117-1-Q	FAN ROOM					0	0
1-207-2-Q	FAN ROOM					0	0
02-45-0-Q	FAN SPACE					0	0
2-207-1-Q	FAN ROOM					0	0
CUI=QG	(Galley/Pantry/Scullery)						
1-129-2-Q	SCULLERY					718	19
		1	V	406	14		
		1	V	312	24		
1-141-2-Q	GALLEY					1473	84
		1	V	624	24		
		4	H	120	96		
		1	H	369	96		
1-186-3-Q	TRASH COMPACTOR SPACE					119	17
		1	V	119	17		
CUI=QL	(Laundry)						
1-47-1-Q	LAUNDRY					229	96
		1	H	144	96		
		1	H	85	96		
CUI=QO	(Office Spaces)						
1-73-1-Q	ENGINEERS OFFICE					235	60
		1	V	175	25		
		1	H	60	96		
1-82-3-Q	SHIP AND SUPPLY OFFICE					258	60
		1	V	168	24		
		1	H	90	96		
01-61-1-Q	CO OFFICE					130	38

Plan ID	Compartment Name	#		Area	Height	Total Area	Avg.Height
		Vents	H/V	(In2)	(In.)	(In2)	(In.)
		1	V	72	12		
		1	V	40	8		
		1	H	18	96		
CUI=QS	(Shops)						
1-12-0-Q	ANCHOR WINDLASS RM AND BOSUN'S WORKSHOP					27	9
		1	V	27	9		
1-82-2-Q	FORWARD REPAIR #2					44	11
		1	V	44	11		
1-82-4-Q	ENGINEERS WORKSHOP					18	3
		2	V	9	3		
1-90-2-Q	ELCTRICIANS WORKSHOP					58	4
		2	V	9	3		
		1	V	40	8		
01-103-0-Q	AVIONICS SHOP					30	5
		1	V	30	5		
2-40-1-Q	ORDNANCE WORKSHOP					250	75
3-152-2-E	ENGINEERS WORK SPACE					68	60
		1	V	48	6		
		1	H	20	114		
2-221-1-Q	AFT REPAIR #3					250	75
CUI=TH	(Trunks/Hoists/Dumbwaiters)						
1-55-1	VENT SHAFT					0	0
1-63-1	AC&WW TRUNK					0	0
3-165-1-Q	SERVICE ELEVATOR TRUNK					0	0
01-55-1	VENT SHAFT					0	0
01-63-1	AC & WW TRUNK					0	0
01-103-1-Q	MACHINERY VENT PLENUM COMPT					0	0
01-103-2-Q	MACHINERY VENT PLENUM COMPT					0	0
02-55-1	VENT SHAFT					0	0
2-58-1	WW & AC TRUNK					0	0
CUI=TU	(Stacks/Engine Uptakes)						
1-109-2	UPTAKE					0	0
1-110-1	UPTAKE					0	0
01-109-2	UPTAKE					0	0
01-110-1	UPTAKE					0	0
02-106-1-Q	STACK					0	0
02-106-2-Q	STACK					0	0
CUI=V	(Voids/Cofferdams)						
1-61-1	VOID					0	0
01-61-1	VOID					0	0
CUI=W	(Water Tank (empty))						
3-77-0-W	WATER					0	0

Table B.2 Barrier Data

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
			3-26A-0-A	STORES	(CUI	= AS)			
S4U	S4U	S4I	3-47-0-C	COMMUNICATIONS CENTE	118.3	0	0		
S4U	S4U		(none)	(weather bulkhead)	139.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	140	0	0		
S4U	S4U		(none)	(weather bulkhead)	48.1	0	0		
S4U			2-26A-0-A	STOREROOMS	229.3	0	0	HS	X
S4U			2-40-1-Q	ORDNANCE WORKSHOP	37	0	0		
			3-47-0-C	COMMUNICATIONS CENTER	(CUI	= C)			
S4I	S4U	S4U	3-26A-0-A	STORES	118.3	0	0		
000		000	3-62-2-L	STAIRWAY	35.1	0	0		
000		000	3-62-2-L	STAIRWAY	26	0	0		
000		000	3-62-2-L	STAIRWAY	35.1	0	0		
000		000	3-62-2-L	STAIRWAY	26	0	0		
S4I	S4U	S4U	3-77-0-W	WATER	176.8	0	0		
S4I	S4U		(none)	(weather bulkhead)	197.1	0	0		
S4I	S4U		(none)	(weather bulkhead)	197.3	0	0		
S4U			02-48-0-C	PILOTHOUSE	280.7	0	0		
S4U			2-47-0-L	CREWS BERTHING	138.4	0	0		
S4U			2-47-1-C	IC ROOM	74.9	0	0		
S4U			2-56-0-L	PASSAGEWAY	90.7	0	0		
S4U			2-58-1	WW & AC TRUNK	23.8	0	0		
S4U			2-58-1-L	SANITARY SPACE	30.6	0	0		
S4U			2-59-2-L	SANITARY SPACE	49.3	0	0		
S4U			2-59-4-L	CREWS LOCKER SPACE	45.7	0	0		
S4U			2-64-1-L	CREWS LOCKER SPACE	69.1	0	0		
S4U			2-66-1-L	CREWS BERTHING	59.1	0	0		
S4U			2-72-2-L	CREWS LOUNGE	68.2	0	0		
S4U			2-75-0-L	SANITARY SPACE	9.6	0	0		
			3-62-2-L	STAIRWAY	(CUI	= LP)			
000		000	3-47-0-C	COMMUNICATIONS CENTE	35.1	0	0		
000		000	3-47-0-C	COMMUNICATIONS CENTE	26	0	0		
000		000	3-47-0-C	COMMUNICATIONS CENTE	35.1	0	0		
000		000	3-47-0-C	COMMUNICATIONS CENTE	26	0	0		
S4U			2-56-0-L	PASSAGEWAY	7.1	0	0		
000		000	2-64-2-L	STAIRWAY	13.4	0	0		
			3-77-0-W	WATER	(CUI	= W)			
S4U	S4U	S4I	3-47-0-C	COMMUNICATIONS CENTE	176.8	0	0		
S4U		S4U	3-82-0-E	AUXILIARY MACHINE SP	200.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	33.3	0	0		
S4U	S4U		(none)	(weather bulkhead)	33.3	0	0		
S4U			2-66-1-L	CREWS BERTHING	57.1	0	0		
S4U			2-72-2-L	CREWS LOUNGE	68.3	0	0		
S4U			2-75-0-L	SANITARY SPACE	8.1	0	0		
S4U			2-80-1-Q	CG LKR	5.7	0	0		
			3-82-0-E	AUXILIARY MACHINE SPACE NO. 2	(CUI	= QA)			

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U		S4U	3-77-0-W	WATER	200.2	0	0		
000		000	3-94-1-L	STAIRWAY	22.1	0	0		
000		000	3-94-1-L	STAIRWAY	42.9	0	0		
000		000	3-94-1-L	STAIRWAY	22.1	0	0		
000		000	3-94-1-L	STAIRWAY	42.9	0	0		
S4U		S4I	3-103-0-E	ENGINE ROOM	236.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	140.3	0	0		
S4U	S4U		(none)	(weather bulkhead)	140.3	0	0		
S4U			2-82-0-E	AMS NO 1	675.6	0	0		
000		000	2-95-1-L	STAIRWAY	21	0	0		
			3-94-1-L	STAIRWAY	(CUI	= LP)			
000		000	3-82-0-E	AUXILIARY MACHINE SP	22.1	0	0		
000		000	3-82-0-E	AUXILIARY MACHINE SP	42.9	0	0		
000		000	3-82-0-E	AUXILIARY MACHINE SP	22.1	0	0		
000		000	3-82-0-E	AUXILIARY MACHINE SP	42.9	0	0		
000		000	2-82-0-E	AMS NO 1	22.4	0	0		
			3-103-0-E	ENGINE ROOM	(CUI	= EM)			
S4I		S4U	3-82-0-E	AUXILIARY MACHINE SP	236.6	0	0		
000		000	3-152A-0-E	ENGINE ROOM EXT	302.6	0	0		
S4I		S4U	2-82-0-E	AMS NO 1	291.2	0	0		
S4I	S4U	S4I	3-152-0-E	ENGINEERING CONTROL	283.1	0	0	DWT	X
S4I	S4U	S4U	3-152-2-E	ENGINEERS WORK SPACE	55.1	0	0	DWT	X
S4I	S4U		(none)	(weather bulkhead)	486	0	0		
S4I	S4U		(none)	(weather bulkhead)	486	0	0		
S4I	S4U		(none)	(weather bulkhead)	388.8	0	0		
S4I	S4U		(none)	(weather bulkhead)	388.8	0	0		
S4I	S4U		(none)	(weather bulkhead)	10	0	0		
S4I	S4U		(none)	(weather bulkhead)	8	0	0		
			3-152A-0-E	ENGINE ROOM EXT	(CUI	= EM)			
S4I		S4U	3-165-1-Q	SERVICE ELEVATOR TRU	26.4	0	0		
S4I		S4U	4-65-1-F	FUEL TANK	70.4	0	0		
000		000	3-103-0-E	ENGINE ROOM	302.6	0	0		
S4I		S4U	4-165-4-F	DIESEL OIL TANK	94.6	0	0		
S4I	S4U		(none)	(weather bulkhead)	112.2	0	0		
S4I	S4U		(none)	(weather bulkhead)	112.3	0	0		
S4U			3-152-0-E	ENGINEERING CONTROL	389.4	0	0		
S4U			3-152-2-E	ENGINEERS WORK SPACE	65	0	0		
S4U			3-160-2-L	SANITARY SPACE	10.2	0	0		
			3-169-2-A	STOREROOM	(CUI	= AS)			
S4U	S4U	S4U	3-165-1-Q	SERVICE ELEVATOR TRU	33.6	0	0	DWT	X
S4U	S4U	S4U	4-65-1-F	FUEL TANK	89.6	0	0		
S4U	S4U	S4U	4-165-4-F	DIESEL OIL TANK	120.4	0	0		
S4U		S4I	3-175-0-A	REFRIGERATED STORES	84	0	0		
S4U		S4I	3-175-0-A	REFRIGERATED STORES	84	0	0	DJ	NC
S4U		S4I	3-175-0-A	REFRIGERATED STORES	84	0	0		
S4U		S4U	4-186-0-J	JP-5 PUMP ROOM	82.6	0	0		
S4U		S4U	4-186-0-J	JP-5 PUMP ROOM	74.2	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U	S4U		(none)	(weather bulkhead)	119	0	0		
S4U	S4U		(none)	(weather bulkhead)	119.1	0	0		
S4U			2-165-0-L	SANITARY SPACE	67	0	0		
S4U			2-165-2-L	CREWS LOUNGE	86.1	0	0		
S4U			2-165-3-L	CREW BERTHING AREA	202.4	0	0		
S4U			2-175-0-L	CREW LOCKER SPACE	85.8	0	0		
			3-175-0-A	REFRIGERATED STORES	(CUI	= AR)			
S4I		S4U	3-169-2-A	STOREROOM	84	0	0		
S4I		S4U	3-169-2-A	STOREROOM	84	0	0	DJ	NC
S4I		S4U	3-169-2-A	STOREROOM	84	0	0		
S4I		S4U	4-186-0-J	JP-5 PUMP ROOM	81.2	0	0		
S4I			2-165-0-L	SANITARY SPACE	4.3	0	0		
S4I			2-165-2-L	CREWS LOUNGE	4.9	0	0		
S4I			2-165-3-L	CREW BERTHING AREA	6.2	0	0		
S4I			2-175-0-L	CREW LOCKER SPACE	110.8	0	0		
S4I			2-178-1-L	STAIRWAY	15.4	0	0		
			4-186-0-J	JP-5 PUMP ROOM	(CUI	= QA)			
S4U		S4U	3-169-2-A	STOREROOM	82.6	0	0		
S4U		S4U	3-169-2-A	STOREROOM	74.2	0	0		
S4U		S4I	3-175-0-A	REFRIGERATED STORES	81.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	21	0	0		
S4U	S4U		(none)	(weather bulkhead)	74.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	119	0	0		
S4U	S4U		(none)	(weather bulkhead)	81.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	119	0	0		
S4U	S4U		(none)	(weather bulkhead)	82.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	21	0	0		
S4U			2-186-0-L	SANITARY SPACE	100.6	0	0		
S4U			2-186-1-L	CREW LOUNGE	34.2	0	0		
S4U			2-186-2-Q	SEA BAG LKR	17.4	0	0		
S4U			2-186-4-L	CREW BERTHING	46.4	0	0		
S4U			2-194-0-L	CREW LOCKER SPACE	93	0	0	HS	X
S4U			2-199-1-L	STAIRWAY	7	0	0		
			2-26A-0-A	STOREROOMS	(CUI	= AS)			
S4U		S4U	2-17-0-A	BOSUN STORES	105.6	0	0	DJ	NC
S4U		S4U	2-40-1-Q	ORDNANCE WORKSHOP	84.8	0	0		
S4U		S4U	2-40-1-Q	ORDNANCE WORKSHOP	35.2	0	0	DJ	NC
S4U	S4U	S4I	2-47-0-L	CREWS BERTHING	94.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	171.5	0	0		
S4U	S4U		(none)	(weather bulkhead)	135.1	0	0		
S4U			3-26A-0-A	STORES	229.3	0	0	HS	X
			2-17-0-A	BOSUN STORES	(CUI	= AS)			
S4U		S4U	2-26A-0-A	STOREROOMS	105.6	0	0	DJ	NC
S4U	S4U		(none)	(weather bulkhead)	78.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	74.5	0	0		
S4U	S4U		(none)	(weather bulkhead)	75.3	0	0		
			2-40-1-Q	ORDNANCE WORKSHOP	(CUI	= QS)			

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U		S4U	2-26A-0-A	STOREROOMS	84.8	0	0		
S4U		S4U	2-26A-0-A	STOREROOMS	35.2	0	0	DJ	NC
S4U	S4U	S4I	2-47-0-L	CREWS BERTHING	22.4	0	0		
S4U	S4U	S4I	2-47-1-C	IC ROOM	67.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	35.5	0	0		
S4U			3-26A-0-A	STORES	37	0	0		
			2-47-0-L	CREWS BERTHING	(CUI	= L5)			
S4I	S4U	S4U	2-26A-0-A	STOREROOMS	94.4	0	0		
S4I	S4U	S4U	2-40-1-Q	ORDNANCE WORKSHOP	22.4	0	0		
S4I		S4I	2-47-1-C	IC ROOM	62.4	0	0		
S4I		S4U	2-56-0-L	PASSAGEWAY	22.4	0	0		
S4I		S4U	2-56-0-L	PASSAGEWAY	30.4	0	0		
S4I		S4U	2-56-0-L	PASSAGEWAY	33.6	0	0	DJ	NC
S4I		S4U	2-59-2-L	SANITARY SPACE	32	-90	-90		
S4I		S4U	2-59-4-L	CREWS LOCKER SPACE	41.6	-90	-90	DJ	NC
S4I	S4U		(none)	(weather bulkhead)	93.7	0	0		
S4U			3-47-0-C	COMMUNICATIONS CENTE	138.4	0	0		
			2-47-1-C	IC ROOM	(CUI	= C)			
S4I	S4U	S4U	2-40-1-Q	ORDNANCE WORKSHOP	67.2	0	0		
S4I		S4I	2-47-0-L	CREWS BERTHING	62.4	0	0		
S4I		S4U	2-56-0-L	PASSAGEWAY	25.6	0	0	DJ	NC
S4I		S4U	2-58-1	WW & AC TRUNK	28.8	0	0		
S4I		S4U	2-58-1-L	SANITARY SPACE	4.8	0	0		
S4I		S4U	2-58-1-L	SANITARY SPACE	60.8	0	0		
S4I	S4U		(none)	(weather bulkhead)	86.2	0	0		
S4U			3-47-0-C	COMMUNICATIONS CENTE	74.9	0	0		
			2-56-0-L	PASSAGEWAY	(CUI	= LP)			
S4U		S4I	2-47-0-L	CREWS BERTHING	22.4	0	0		
S4U		S4I	2-47-0-L	CREWS BERTHING	30.4	0	0		
S4U		S4I	2-47-0-L	CREWS BERTHING	33.6	0	0	DJ	NC
S4U		S4I	2-47-1-C	IC ROOM	25.6	0	0	DJ	NC
S4U		S4U	2-58-1	WW & AC TRUNK	52.8	0	0		
S4U		S4U	2-59-2-L	SANITARY SPACE	100.8	0	0		
S4U		S4U	2-64-1-L	CREWS LOCKER SPACE	59.2	0	0	DJ	NC
000		000	2-64-2-L	STAIRWAY	40	0	0		
000		000	2-64-2-L	STAIRWAY	22.4	0	0		
000		000	2-64-2-L	STAIRWAY	40	0	0		
000		000	2-64-2-L	STAIRWAY	22.4	0	0		
S4U		S4I	2-66-1-L	CREWS BERTHING	24	0	0		
S4U		NPI	2-72-2-L	CREWS LOUNGE	25.6	0	0		
S4U		NPI	2-72-2-L	CREWS LOUNGE	30.4	0	0	DJ	NC
S4U		S4U	2-75-0-L	SANITARY SPACE	28.8	0	0	DJ	NC
S4U			3-47-0-C	COMMUNICATIONS CENTE	90.7	0	0		
S4U			3-62-2-L	STAIRWAY	7.1	0	0		
			2-58-1	WW & AC TRUNK	(CUI	= TH)			
S4U		S4I	2-47-1-C	IC ROOM	28.8	0	0		
S4U		S4U	2-56-0-L	PASSAGEWAY	52.8	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U		S4U	2-58-1-L	SANITARY SPACE	46.4	0	0		
S4U		S4U	2-64-1-L	CREWS LOCKER SPACE	28.8	0	0		
S4U		S4U	2-64-1-L	CREWS LOCKER SPACE	6.4	0	0		
S4U			3-47-0-C	COMMUNICATIONS CENTE	23.8	0	0		
			2-58-1-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4I	2-47-1-C	IC ROOM	4.8	0	0		
S4U		S4I	2-47-1-C	IC ROOM	60.8	0	0		
S4U		S4U	2-58-1	WW & AC TRUNK	46.4	0	0		
S4U		S4U	2-64-1-L	CREWS LOCKER SPACE	40	0	0	DJ	NC
S4U		S4U	2-64-1-L	CREWS LOCKER SPACE	14.4	0	0		
S4U		S4I	2-66-1-L	CREWS BERTHING	20.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	65.6	0	0		
S4U			3-47-0-C	COMMUNICATIONS CENTE	30.6	0	0		
			2-59-2-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4I	2-47-0-L	CREWS BERTHING	32	-90	-90		
S4U		S4U	2-56-0-L	PASSAGEWAY	100.8	0	0		
S4U		S4U	2-59-4-L	CREWS LOCKER SPACE	100.8	0	0	DJ	NC
S4U		NPI	2-72-2-L	CREWS LOUNGE	32	-90	-90		
S4U			3-47-0-C	COMMUNICATIONS CENTE	49.3	0	0		
			2-59-4-L	CREWS LOCKER SPACE	(CUI	= AS)			
S4U		S4I	2-47-0-L	CREWS BERTHING	41.6	-90	-90	DJ	NC
S4U		S4U	2-59-2-L	SANITARY SPACE	100.8	0	0	DJ	NC
S4U		NPI	2-72-2-L	CREWS LOUNGE	52.8	-90	-90		
S4U	S4U		(none)	(weather bulkhead)	49.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	11.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	51.2	0	0		
S4U			3-47-0-C	COMMUNICATIONS CENTE	45.7	0	0		
			2-64-1-L	CREWS LOCKER SPACE	(CUI	= AS)			
S4U		S4U	2-56-0-L	PASSAGEWAY	59.2	0	0	DJ	NC
S4U		S4U	2-58-1	WW & AC TRUNK	28.8	0	0		
S4U		S4U	2-58-1	WW & AC TRUNK	6.4	0	0		
S4U		S4U	2-58-1-L	SANITARY SPACE	40	0	0	DJ	NC
S4U		S4U	2-58-1-L	SANITARY SPACE	14.4	0	0		
S4U		S4I	2-66-1-L	CREWS BERTHING	51.2	0	0		
S4U		S4I	2-66-1-L	CREWS BERTHING	70.4	0	0	DJ	NC
S4U			3-47-0-C	COMMUNICATIONS CENTE	69.1	0	0		
			2-64-2-L	STAIRWAY	(CUI	= LP)			
000		000	2-56-0-L	PASSAGEWAY	40	0	0		
000		000	2-56-0-L	PASSAGEWAY	22.4	0	0		
000		000	2-56-0-L	PASSAGEWAY	40	0	0		
000		000	2-56-0-L	PASSAGEWAY	22.4	0	0		
000		000	3-62-2-L	STAIRWAY	13.4	0	0		
			2-66-1-L	CREWS BERTHING	(CUI	= L5)			
S4I		S4U	2-56-0-L	PASSAGEWAY	24	0	0		
S4I		S4U	2-58-1-L	SANITARY SPACE	20.8	0	0		
S4I		S4U	2-64-1-L	CREWS LOCKER SPACE	51.2	0	0		
S4I		S4U	2-64-1-L	CREWS LOCKER SPACE	70.4	0	0	DJ	NC

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4I		S4U	2-75-0-L	SANITARY SPACE	36.8	0	0		
S4I		S4U	2-80-1-Q	CG LKR	17.6	0	0	DJ	NC
S4I	S4U	S4U	2-82-0-E	AMS NO 1	100.8	0	0		
S4I	S4U		(none)	(weather bulkhead)	17.6	0	0		
S4I	S4U		(none)	(weather bulkhead)	57.8	0	0		
S4I	S4U		(none)	(weather bulkhead)	54.4	0	0		
S4I	S4U		(none)	(weather bulkhead)	4.8	0	0		
S4U			3-47-0-C	COMMUNICATIONS CENTE	59.1	0	0		
S4U			3-77-0-W	WATER	57.1	0	0		
			2-72-2-L	CREWS LOUNGE	(CUI	= LL)			
NPI		S4U	2-56-0-L	PASSAGEWAY	25.6	0	0		
NPI		S4U	2-56-0-L	PASSAGEWAY	30.4	0	0	DJ	NC
NPI		S4U	2-59-2-L	SANITARY SPACE	32	-90	-90		
NPI		S4U	2-59-4-L	CREWS LOCKER SPACE	52.8	-90	-90		
NPI		S4U	2-75-0-L	SANITARY SPACE	9.6	-90	-90		
NPI		S4U	2-75-0-L	SANITARY SPACE	20.8	-90	-90		
NPI		S4U	2-75-0-L	SANITARY SPACE	17.6	-90	-90		
NPI		S4U	2-75-0-L	SANITARY SPACE	16	-90	-90		
NPI		S4U	2-80-1-Q	CG LKR	17.6	0	0		
NPI	S4U	S4U	2-82-0-E	AMS NO 1	129.6	0	0		
NPI	S4U		(none)	(weather bulkhead)	36.8	0	0		
NPI	S4U		(none)	(weather bulkhead)	11.2	0	0		
NPI	S4U		(none)	(weather bulkhead)	48	0	0		
S4U			3-47-0-C	COMMUNICATIONS CENTE	68.2	0	0		
S4U			3-77-0-W	WATER	68.3	0	0		
			2-75-0-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4U	2-56-0-L	PASSAGEWAY	28.8	0	0	DJ	NC
S4U		S4I	2-66-1-L	CREWS BERTHING	36.8	0	0		
S4U		NPI	2-72-2-L	CREWS LOUNGE	9.6	-90	-90		
S4U		NPI	2-72-2-L	CREWS LOUNGE	20.8	-90	-90		
S4U		NPI	2-72-2-L	CREWS LOUNGE	17.6	-90	-90		
S4U		NPI	2-72-2-L	CREWS LOUNGE	16	-90	-90		
S4U		S4U	2-80-1-Q	CG LKR	20.8	0	0		
S4U			3-47-0-C	COMMUNICATIONS CENTE	9.6	0	0		
S4U			3-77-0-W	WATER	8.1	0	0		
			2-80-1-Q	CG LKR	(CUI	= AG)			
S4U		S4I	2-66-1-L	CREWS BERTHING	17.6	0	0	DJ	NC
S4U		NPI	2-72-2-L	CREWS LOUNGE	17.6	0	0		
S4U		S4U	2-75-0-L	SANITARY SPACE	20.8	0	0		
S4U	S4U	S4U	2-82-0-E	AMS NO 1	20.8	0	0		
S4U			3-77-0-W	WATER	5.7	0	0		
			2-82-0-E	AMS NO 1	(CUI	= QA)			
S4U		S4I	3-103-0-E	ENGINE ROOM	291.2	0	0		
S4U	S4U	S4I	2-66-1-L	CREWS BERTHING	100.8	0	0		
S4U	S4U	NPI	2-72-2-L	CREWS LOUNGE	129.6	0	0		
S4U	S4U	S4U	2-80-1-Q	CG LKR	20.8	0	0		
000		000	2-95-1-L	STAIRWAY	40	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
000		000	2-95-1-L	STAIRWAY	33.6	0	0		
000		000	2-95-1-L	STAIRWAY	40	0	0		
000		000	2-95-1-L	STAIRWAY	33.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	171.5	0	0		
S4U	S4U		(none)	(weather bulkhead)	171.5	0	0		
S4U	S4U		(none)	(weather bulkhead)	14.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	6.4	0	0		
S4U			3-82-0-E	AUXILIARY MACHINE SP	675.6	0	0		
000		000	3-94-1-L	STAIRWAY	22.4	0	0		
			2-95-1-L	STAIRWAY	(CUI	= LP)			
000		000	2-82-0-E	AMS NO 1	40	0	0		
000		000	2-82-0-E	AMS NO 1	33.6	0	0		
000		000	2-82-0-E	AMS NO 1	40	0	0		
000		000	2-82-0-E	AMS NO 1	33.6	0	0		
000		000	3-82-0-E	AUXILIARY MACHINE SP	21	0	0		
			3-152-0-E	ENGINEERING CONTROL CENTER	(CUI	= C)			
S4I	S4U	S4U	3-165-1-Q	SERVICE ELEVATOR TRU	38.4	0	0		
S4I		S4U	3-165-1-Q	SERVICE ELEVATOR TRU	7.2	0	0		
S4I		S4U	4-65-1-F	FUEL TANK	19.2	0	0		
S4I	S4U	S4I	3-103-0-E	ENGINE ROOM	283.1	0	0	DWT	X
S4I		S4U	4-165-4-F	DIESEL OIL TANK	17.4	0	0		
S4I		S4U	3-152-2-E	ENGINEERS WORK SPACE	125.4	0	0	DJ	NC
S4I	S4U	S4U	2-165-0-L	SANITARY SPACE	67.2	0	0		
S4I		S4U	2-165-1-Q	SEABAG LKR	35.2	0	0		
S4I	S4U	NPI	2-165-2-L	CREWS LOUNGE	25.6	0	0		
S4I		S4I	2-165-3-L	CREW BERTHING AREA	102.4	0	0		
S4I	S4U		(none)	(weather bulkhead)	125.5	0	0		
S4I	S4U		(none)	(weather bulkhead)	35.2	0	0		
S4U			3-152A-0-E	ENGINE ROOM EXT	389.4	0	0		
			3-152-2-E	ENGINEERS WORK SPACE	(CUI	= QS)			
S4U	S4U	S4I	3-103-0-E	ENGINE ROOM	55.1	0	0	DWT	X
S4U		S4U	4-165-4-F	DIESEL OIL TANK	5.1	0	0		
S4U		S4I	3-152-0-E	ENGINEERING CONTROL	125.4	0	0	DJ	NC
S4U		S4U	3-160-2-L	SANITARY SPACE	38	-90	-90	DJ	NC
S4U		S4U	3-160-2-L	SANITARY SPACE	25.5	-90	-90		
S4U	S4U	NPI	2-165-2-L	CREWS LOUNGE	27.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	76	0	0		
S4U			3-152A-0-E	ENGINE ROOM EXT	65	0	0		
			3-160-2-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4U	4-165-4-F	DIESEL OIL TANK	3.3	0	0		
S4U		S4U	3-152-2-E	ENGINEERS WORK SPACE	38	-90	-90	DJ	NC
S4U		S4U	3-152-2-E	ENGINEERS WORK SPACE	25.5	-90	-90		
S4U	S4U	NPI	2-165-2-L	CREWS LOUNGE	19.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	49.4	0	0		
S4U			3-152A-0-E	ENGINE ROOM EXT	10.2	0	0		
			2-165-0-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4U	3-165-1-Q	SERVICE ELEVATOR TRU	38.4	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U		S4U	3-165-1-Q	SERVICE ELEVATOR TRU	32	0	0		
S4U	S4U	S4I	3-152-0-E	ENGINEERING CONTROL	67.2	0	0		
S4U		NPI	2-165-2-L	CREWS LOUNGE	75.2	-90	-90		
S4U		NPI	2-165-2-L	CREWS LOUNGE	30.4	0	0		
S4U		S4I	2-165-3-L	CREW BERTHING AREA	43.2	-90	-90		
S4U		S4U	2-175-0-L	CREW LOCKER SPACE	75.2	0	0	DJ	NC
S4U			4-165-4-F	DIESEL OIL TANK	33.6	0	0		
S4U			3-169-2-A	STOREROOM	67	0	0		
S4I			3-175-0-A	REFRIGERATED STORES	4.3	0	0		
			2-165-1-Q	SEABAG LKR	(CUI	= AG)			
S4U		S4U	3-165-1-Q	SERVICE ELEVATOR TRU	25.6	0	0		
S4U		S4I	3-152-0-E	ENGINEERING CONTROL	35.2	0	0		
S4U		S4I	2-165-3-L	CREW BERTHING AREA	35.2	0	0		
S4U		S4I	2-165-3-L	CREW BERTHING AREA	25.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	35.2	-90	-90		
S4U	S4U		(none)	(weather bulkhead)	25.6	0	0	DJ	NC
S4U	S4U		(none)	(weather bulkhead)	43.5	0	0		
S4U			4-65-1-F	FUEL TANK	14.1	0	0		
			2-165-2-L	CREWS LOUNGE	(CUI	= LL)			
NPI	S4U	S4I	3-152-0-E	ENGINEERING CONTROL	25.6	0	0		
NPI	S4U	S4U	3-152-2-E	ENGINEERS WORK SPACE	27.2	0	0		
NPI	S4U	S4U	3-160-2-L	SANITARY SPACE	19.2	0	0		
NPI		S4U	2-165-0-L	SANITARY SPACE	75.2	-90	-90		
NPI		S4U	2-165-0-L	SANITARY SPACE	30.4	0	0		
NPI		S4U	2-175-0-L	CREW LOCKER SPACE	28.8	0	0	DJ	NC
NPI		S4U	2-175-0-L	CREW LOCKER SPACE	102.4	0	0		
NPI	S4U		(none)	(weather bulkhead)	104	0	0		
S4U			4-165-4-F	DIESEL OIL TANK	35.2	0	0		
S4U			3-169-2-A	STOREROOM	86.1	0	0		
S4I			3-175-0-A	REFRIGERATED STORES	4.9	0	0		
			2-165-3-L	CREW BERTHING AREA	(CUI	= L5)			
S4I		S4U	3-165-1-Q	SERVICE ELEVATOR TRU	32	0	0		
S4I		S4I	3-152-0-E	ENGINEERING CONTROL	102.4	0	0		
S4I		S4U	2-165-0-L	SANITARY SPACE	43.2	-90	-90		
S4I		S4U	2-165-1-Q	SEABAG LKR	35.2	0	0		
S4I		S4U	2-165-1-Q	SEABAG LKR	25.6	0	0		
S4I		S4U	2-175-0-L	CREW LOCKER SPACE	4.8	0	0		
S4I		S4U	2-175-0-L	CREW LOCKER SPACE	92.8	0	0	DJ	NC
S4I		S4U	2-186-0-L	SANITARY SPACE	4.8	0	0		
S4I		NPI	2-186-1-L	CREW LOUNGE	91.2	0	0		
S4I	S4U		(none)	(weather bulkhead)	168	0	0		
S4I	S4U		(none)	(weather bulkhead)	105.6	0	0		
S4I	S4U		(none)	(weather bulkhead)	67.2	0	0		
S4U			4-65-1-F	FUEL TANK	51.1	0	0		
S4U			3-169-2-A	STOREROOM	202.4	0	0		
S4I			3-175-0-A	REFRIGERATED STORES	6.2	0	0		
			2-175-0-L	CREW LOCKER SPACE	(CUI	= AS)			

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U		S4U	2-165-0-L	SANITARY SPACE	75.2	0	0	DJ	NC
S4U		NPI	2-165-2-L	CREWS LOUNGE	28.8	0	0	DJ	NC
S4U		NPI	2-165-2-L	CREWS LOUNGE	102.4	0	0		
S4U		S4I	2-165-3-L	CREW BERTHING AREA	4.8	0	0		
S4U		S4I	2-165-3-L	CREW BERTHING AREA	92.8	0	0	DJ	NC
000		000	2-178-1-L	STAIRWAY	38.4	0	0		
000		000	2-178-1-L	STAIRWAY	25.6	0	0		
000		000	2-178-1-L	STAIRWAY	38.4	0	0		
000		000	2-178-1-L	STAIRWAY	25.6	0	0		
S4U		S4U	2-186-0-L	SANITARY SPACE	76.8	0	0		
S4U		S4U	2-186-2-Q	SEA BAG LKR	46.4	0	0		
S4U		S4I	2-186-4-L	CREW BERTHING	59.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	64	0	0		
S4U			3-169-2-A	STOREROOM	85.8	0	0		
S4I			3-175-0-A	REFRIGERATED STORES	110.8	0	0		
			2-178-1-L	STAIRWAY	(CUI	= LP)			
000		000	2-175-0-L	CREW LOCKER SPACE	38.4	0	0		
000		000	2-175-0-L	CREW LOCKER SPACE	25.6	0	0		
000		000	2-175-0-L	CREW LOCKER SPACE	38.4	0	0		
000		000	2-175-0-L	CREW LOCKER SPACE	25.6	0	0		
S4I			3-175-0-A	REFRIGERATED STORES	15.4	0	0		
			2-186-0-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4I	2-165-3-L	CREW BERTHING AREA	4.8	0	0		
S4U		S4U	2-175-0-L	CREW LOCKER SPACE	76.8	0	0		
S4U		NPI	2-186-1-L	CREW LOUNGE	80	0	0		
S4U		S4U	2-186-2-Q	SEA BAG LKR	24	0	0		
S4U		S4I	2-186-4-L	CREW BERTHING	56	0	0		
S4U		S4U	2-194-0-L	CREW LOCKER SPACE	81.6	0	0	DJ	NC
S4U			4-186-0-J	JP-5 PUMP ROOM	100.6	0	0		
			2-186-1-L	CREW LOUNGE	(CUI	= LL)			
NPI		S4I	2-165-3-L	CREW BERTHING AREA	91.2	0	0		
NPI		S4U	2-186-0-L	SANITARY SPACE	80	0	0		
NPI		S4U	2-194-0-L	CREW LOCKER SPACE	59.2	0	0		
NPI		S4U	2-194-0-L	CREW LOCKER SPACE	14.4	0	0		
NPI		S4U	2-194-0-L	CREW LOCKER SPACE	28.8	0	0	DJ	NC
NPI	S4U		(none)	(weather bulkhead)	25.6	0	0		
NPI	S4U		(none)	(weather bulkhead)	40	0	0		
S4U			4-186-0-J	JP-5 PUMP ROOM	34.2	0	0		
			2-186-2-Q	SEA BAG LKR	(CUI	= AG)			
S4U		S4U	2-175-0-L	CREW LOCKER SPACE	46.4	0	0		
S4U		S4U	2-186-0-L	SANITARY SPACE	24	0	0		
S4U		S4I	2-186-4-L	CREW BERTHING	24	-90	-90		
S4U		S4I	2-186-4-L	CREW BERTHING	46.4	-90	-90	DJ	NC
S4U			4-186-0-J	JP-5 PUMP ROOM	17.4	0	0		
			2-186-4-L	CREW BERTHING	(CUI	= L5)			
S4I		S4U	2-175-0-L	CREW LOCKER SPACE	59.2	0	0		
S4I		S4U	2-186-0-L	SANITARY SPACE	56	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4I		S4U	2-186-2-Q	SEA BAG LKR	24	-90	-90		
S4I		S4U	2-186-2-Q	SEA BAG LKR	46.4	-90	-90	DJ	NC
S4I		S4U	2-194-0-L	CREW LOCKER SPACE	88	0	0	DJ	NC
S4I	S4U	S4U	2-207A-0-A	STORAGE AREA	100.8	0	0		
S4I	S4U		(none)	(weather bulkhead)	168.1	0	0		
S4U			4-186-0-J	JP-5 PUMP ROOM	46.4	0	0		
			2-194-0-L	CREW LOCKER SPACE	(CUI	= AS)			
S4U		S4U	2-186-0-L	SANITARY SPACE	81.6	0	0	DJ	NC
S4U		NPI	2-186-1-L	CREW LOUNGE	59.2	0	0		
S4U		NPI	2-186-1-L	CREW LOUNGE	14.4	0	0		
S4U		NPI	2-186-1-L	CREW LOUNGE	28.8	0	0	DJ	NC
S4U		S4I	2-186-4-L	CREW BERTHING	88	0	0	DJ	NC
000		000	2-199-1-L	STAIRWAY	40	0	0		
000		000	2-199-1-L	STAIRWAY	24	0	0		
S4U		S4U	2-199-1-L	STAIRWAY	40	0	0		
000		000	2-199-1-L	STAIRWAY	24	0	0		
S4U	S4U	S4U	2-207-1-Q	FAN ROOM	59.2	0	0		
S4U	S4U	S4U	2-207A-0-A	STORAGE AREA	33.6	0	0		
S4U	S4U	S4U	2-207A-0-A	STORAGE AREA	72	0	0		
S4U	S4U		(none)	(weather bulkhead)	40	0	0		
S4U	S4U		(none)	(weather bulkhead)	4.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	62.4	0	0		
S4U			4-186-0-J	JP-5 PUMP ROOM	93	0	0	HS	X
			2-199-1-L	STAIRWAY	(CUI	= LP)			
000		000	2-194-0-L	CREW LOCKER SPACE	40	0	0		
000		000	2-194-0-L	CREW LOCKER SPACE	24	0	0		
S4U		S4U	2-194-0-L	CREW LOCKER SPACE	40	0	0		
000		000	2-194-0-L	CREW LOCKER SPACE	24	0	0		
S4U			4-186-0-J	JP-5 PUMP ROOM	7	0	0		
			2-207-1-Q	FAN ROOM	(CUI	= QF)			
S4U	S4U	S4U	2-194-0-L	CREW LOCKER SPACE	59.2	0	0		
S4U	S4U	S4U	2-207A-0-A	STORAGE AREA	30.4	0	0	DJ	NC
S4U		S4U	2-207A-0-A	STORAGE AREA	36.8	0	0		
S4U		S4U	2-207A-0-A	STORAGE AREA	27.2	0	0		
S4U		S4U	2-207A-0-A	STORAGE AREA	22.4	0	0		
S4U	S4U	S4U	2-207A-0-A	STORAGE AREA	57.6	0	0		
S4U		S4U	2-210-1-L	STAIRWAY	27.2	0	0		
S4U		S4U	2-210-1-L	STAIRWAY	36.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	27.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	36.8	0	0		
			2-207A-0-A	STORAGE AREA	(CUI	= AS)			
S4U	S4U	S4I	2-186-4-L	CREW BERTHING	100.8	0	0		
S4U	S4U	S4U	2-194-0-L	CREW LOCKER SPACE	33.6	0	0		
S4U	S4U	S4U	2-194-0-L	CREW LOCKER SPACE	72	0	0		
S4U	S4U	S4U	2-207-1-Q	FAN ROOM	30.4	0	0	DJ	NC
S4U		S4U	2-207-1-Q	FAN ROOM	36.8	0	0		
S4U		S4U	2-207-1-Q	FAN ROOM	27.2	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U		S4U	2-207-1-Q	FAN ROOM	22.4	0	0		
S4U	S4U	S4U	2-207-1-Q	FAN ROOM	57.6	0	0		
S4U		S4U	2-210-1-L	STAIRWAY	46.4	0	0		
000		000	2-210-1-L	STAIRWAY	36.8	0	0		
S4U		S4U	2-214-2-M	SMALL ARMS MAGAZINE	56	0	0		
S4U		S4U	2-214-2-M	SMALL ARMS MAGAZINE	54.4	0	0		
S4U		S4U	2-214-2-M	SMALL ARMS MAGAZINE	56	0	0		
S4U		S4U	2-214-2-M	SMALL ARMS MAGAZINE	54.4	0	0	DJ	NC
S4U		S4U	2-221-1-Q	AFT REPAIR #3	60.8	0	0	DJ	NC
S4U		S4U	2-221-1-Q	AFT REPAIR #3	78.4	0	0		
S4U		S4U	3-228-0-E	STEERING GEAR ROOM	177.6	0	0	DWT	Y
S4U	S4U		(none)	(weather bulkhead)	108.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	57.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	112.3	0	0		
S4U	S4U		(none)	(weather bulkhead)	19.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	27.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	59.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	46.4	0	0		
			2-210-1-L	STAIRWAY	(CUI	= LP)			
S4U		S4U	2-207-1-Q	FAN ROOM	27.2	0	0		
S4U		S4U	2-207-1-Q	FAN ROOM	36.8	0	0		
S4U		S4U	2-207A-0-A	STORAGE AREA	46.4	0	0		
000		000	2-207A-0-A	STORAGE AREA	36.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	19.2	0	0		
			2-221-1-Q	AFT REPAIR #3	(CUI	= QS)			
S4U		S4U	2-207A-0-A	STORAGE AREA	60.8	0	0	DJ	NC
S4U		S4U	2-207A-0-A	STORAGE AREA	78.4	0	0		
S4U		S4U	3-228-0-E	STEERING GEAR ROOM	76.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	60.8	0	0		
			3-228-0-E	STEERING GEAR ROOM	(CUI	= QA)			
S4U		S4U	2-207A-0-A	STORAGE AREA	177.6	0	0	DWT	Y
S4U		S4U	2-221-1-Q	AFT REPAIR #3	76.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	187.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	201.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	187.6	0	0		
			1-5-0-K	FLAMMABLE LIQ. STOREROOM	(CUI	= K)			
S4U		S4U	1-12-0-Q	ANCHOR WINDLASS RM A	94.4	0	0	DWT	X
S4U	S4U		(none)	(weather bulkhead)	59	0	0		
S4U	S4U		(none)	(weather bulkhead)	58.5	0	0		
S4U	S4U		(none)	(weather bulkhead)	59.2	0	0		
S4U			(none)	(weather overhead)	67.2	0	0		
			1-12-0-Q	ANCHOR WINDLASS RM AND BOSUN'S WORKSHOP	(CUI	= QS)			
S4U		S4U	1-5-0-K	FLAMMABLE LIQ. STORE	94.4	0	0	DWT	X
S4U	S4U	S4U	1-26-0-M	MAGAZINE	94.4	0	0		
S4U	S4U	S4I	1-26-1-C	GUN CONTROL BOOTH	32	0	0		
S4U	S4U	S4U	1-26-2-L	PASSAGEWAY	48	0	0	DWT	Y
S4U	S4U		(none)	(weather bulkhead)	121	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U	S4U		(none)	(weather bulkhead)	121	0	0		
S4U	S4U		(none)	(weather bulkhead)	16	0	0		
S4U	S4U		(none)	(weather bulkhead)	6.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	6.4	0	0		
S4U			(none)	(weather overhead)	264.1	0	0		
			1-26-1-C	GUN CONTROL BOOTH	(CUI	= C)			
S4I	S4U	S4U	1-12-0-Q	ANCHOR WINDLASS RM A	32	0	0		
S4I	S4U	S4U	1-26-0-M	MAGAZINE	54.4	0	0	DWT	X
S4I	S4U	S4U	1-26-0-M	MAGAZINE	43.2	0	0		
S4I	S4U		(none)	(weather bulkhead)	55.5	0	0		
S4U			(none)	(weather overhead)	32	0	0		
			1-26-2-L	PASSAGEWAY	(CUI	= LP)			
S4U	S4U	S4U	1-12-0-Q	ANCHOR WINDLASS RM A	48	0	0	DWT	Y
S4U	S4U	S4U	1-26-0-M	MAGAZINE	132.8	0	0	DWT	X
S4U	S4U	S4U	1-43-2-Q	FAN ROOM	33.6	0	0	DWT	X
S4U	S4U	S4U	1-47-0-L	PASSAGEWAY	64	0	0	DWT	X
S4U	S4U		(none)	(weather bulkhead)	167.2	0	0		
S4U			(none)	(weather overhead)	145.6	0	0	HS	X
			1-43-2-Q	FAN ROOM	(CUI	= QF)			
S4U	S4U	S4U	1-26-0-M	MAGAZINE	33.6	0	0		
S4U	S4U	S4U	1-26-0-M	MAGAZINE	32	0	0		
S4U	S4U	S4U	1-26-2-L	PASSAGEWAY	33.6	0	0	DWT	X
S4U	S4U	S4U	1-47-0-L	PASSAGEWAY	32	0	0		
S4U			(none)	(weather overhead)	16.8	0	0		
			1-47-0-L	PASSAGEWAY	(CUI	= LP)			
S4U		S4U	1-26-0-M	MAGAZINE	16	0	0		
S4U	S4U	S4U	1-26-2-L	PASSAGEWAY	64	0	0	DWT	X
S4U	S4U	S4U	1-43-2-Q	FAN ROOM	32	0	0		
S4U	S4U	S4U	1-47-1-Q	LAUNDRY	36.8	0	0	DWT	X
S4U		S4U	1-51-2-L	SANITARY SPACE	78.4	0	0		
S4U		S4U	1-51-2-L	SANITARY SPACE	84.8	0	0	DJ	NC
S4U		S4U	1-53-1-Q	MOVIE LKR	25.6	0	0	DJ	NC
S4U		S4U	1-55-1	VENT SHAFT	20.8	0	0		
S4U		S4U	1-56-1-Q	LOCKER	25.6	0	0	DJ	NC
S4U		S4U	1-56-1-Q	LOCKER	22.4	0	0		
S4U		S4U	1-61-1	VOID	16	0	0		
S4U		S4U	1-62-2-L	STAIRWAY	22.4	0	0		
S4U		S4U	1-62-2-Q	SEABAG LKR	12.8	0	0		
000		000	1-63-0-L	PASASGEWAY	33.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	27.2	0	0		
S4U			01-47-2-L	XO STATEROOM	55.9	0	0		
S4U			01-47-4-L	SANITARY SPACE	3.2	0	0	HS	X
S4U			01-52-0-L	PASSAGEWAY	32.2	0	0		
S4U			(none)	(weather overhead)	20.4	0	0		
			1-47-1-Q	LAUNDRY	(CUI	= QL)			
S4U	S4U	S4U	1-26-0-M	MAGAZINE	113.6	0	0		
S4U	S4U	S4U	1-47-0-L	PASSAGEWAY	36.8	0	0	DWT	X

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U	S4U	S4U	1-53-1-Q	MOVIE LKR	22.4	-90	-90		
S4U	S4U	S4U	1-53-1-Q	MOVIE LKR	25.6	-90	-90		
S4U	S4U	S4U	1-55-1	VENT SHAFT	28.8	0	0		
S4U	S4U	S4U	1-55-1	VENT SHAFT	20.8	0	0		
S4U	S4U	S4U	1-58-1-L	CREWS LOCKER SPACE	64	-90	-90		
S4U	S4U		(none)	(weather bulkhead)	83.2	0	0		
S4U			01-47-1-L	VESTIBULE	14.8	0	0		
S4U			01-47-3-L	SANITARY SPACE	32.6	0	0		
S4U			01-47-5-L	CO STATEROOM	58	0	0		
S4U			(none)	(weather overhead)	17.8	0	0		
			1-51-2-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4U	1-47-0-L	PASSAGEWAY	78.4	0	0		
S4U		S4U	1-47-0-L	PASSAGEWAY	84.8	0	0	DJ	NC
S4U		S4I	1-61-2-L	CREWS BERTHING	48	-90	-90		
S4U		S4U	1-62-2-Q	SEABAG LKR	44.8	-90	-90		
S4U	S4U		(none)	(weather bulkhead)	86	0	0		
S4U			01-47-2-L	XO STATEROOM	44.1	0	0		
S4U			01-47-4-L	SANITARY SPACE	32.3	0	0		
S4U			01-52-0-L	PASSAGEWAY	11.4	0	0		
S4U			01-58-2-L	EO STATEROOM	24.7	0	0		
			1-53-1-Q	MOVIE LKR	(CUI	= AS)			
S4U		S4U	1-47-0-L	PASSAGEWAY	25.6	0	0	DJ	NC
S4U	S4U	S4U	1-47-1-Q	LAUNDRY	22.4	-90	-90		
S4U	S4U	S4U	1-47-1-Q	LAUNDRY	25.6	-90	-90		
S4U		S4U	1-56-1-Q	LOCKER	22.4	-90	-90		
S4U			01-52-0-L	PASSAGEWAY	8.4	0	0		
			1-55-1	VENT SHAFT	(CUI	= TH)			
S4U		S4U	1-47-0-L	PASSAGEWAY	20.8	0	0		
S4U	S4U	S4U	1-47-1-Q	LAUNDRY	28.8	0	0		
S4U	S4U	S4U	1-47-1-Q	LAUNDRY	20.8	0	0		
S4U		S4U	1-56-1-Q	LOCKER	25.6	0	0		
S4U		S4U	1-58-1-L	CREWS LOCKER SPACE	25.6	0	0		
S4U		S4U	1-61-1	VOID	28.8	0	0		
S4U			01-55-1	VENT SHAFT	20.9	0	0		
			1-56-1-Q	LOCKER	(CUI	= AG)			
S4U		S4U	1-47-0-L	PASSAGEWAY	25.6	0	0	DJ	NC
S4U		S4U	1-47-0-L	PASSAGEWAY	22.4	0	0		
S4U		S4U	1-53-1-Q	MOVIE LKR	22.4	-90	-90		
S4U		S4U	1-55-1	VENT SHAFT	25.6	0	0		
S4U			01-52-0-L	PASSAGEWAY	9	0	0		
			1-58-1-L	CREWS LOCKER SPACE	(CUI	= AS)			
S4U	S4U	S4U	1-47-1-Q	LAUNDRY	64	-90	-90		
S4U		S4U	1-55-1	VENT SHAFT	25.6	0	0		
S4U		S4U	1-61-1	VOID	16	0	0		
S4U		S4U	1-63-0-L	PASASGEWAY	59.2	0	0	DJ	NC
S4U		S4U	1-63-1	AC&WW TRUNK	19.2	0	0		
S4U		S4U	1-63-1	AC&WW TRUNK	16	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U		NPI	1-73-1-Q	ENGINEERS OFFICE	97.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	117.7	0	0		
S4U			01-47-5-L	CO STATEROOM	34.7	0	0		
S4U			01-52-0-L	PASSAGEWAY	7.7	0	0		
S4U			01-61-1-Q	CO OFFICE	55.2	0	0		
S4U			01-68-0-L	PASSAGEWAY	10.9	0	0		
S4U			01-68-3-L	WARDROOM STATEROOM	39.2	0	0		
			1-61-1	VOID	(CUI	= V)			
S4U		S4U	1-47-0-L	PASSAGEWAY	16	0	0		
S4U		S4U	1-55-1	VENT SHAFT	28.8	0	0		
S4U		S4U	1-58-1-L	CREWS LOCKER SPACE	16	0	0		
S4U		S4U	1-63-1	AC&WW TRUNK	28.8	0	0		
S4U			01-61-1	VOID	7.2	0	0		
			1-61-2-L	CREWS BERTHING	(CUI	= L5)			
S4I		S4U	1-51-2-L	SANITARY SPACE	48	-90	-90		
S4I		S4U	1-62-2-Q	SEABAG LKR	17.6	-90	-90		
S4I		S4U	1-62-2-Q	SEABAG LKR	32	-90	-90	DJ	NC
S4I		S4U	1-63-0-L	PASASGEWAY	83.2	0	0	DJ	NC
S4I		S4U	1-63-0-L	PASASGEWAY	33.6	0	0		
S4I		S4U	1-65-2-Q	FOUL WEATHER AND LIF	27.2	0	0		
S4I		S4U	1-65-2-Q	FOUL WEATHER AND LIF	51.2	0	0		
S4I	S4U	S4U	1-82-2-Q	FORWARD REPAIR #2	70.4	0	0		
S4I	S4U	S4U	1-82-4-Q	ENGINEERS WORKSHOP	60.8	0	0		
S4I	S4U		(none)	(weather bulkhead)	108.8	0	0		
S4I	S4U		(none)	(weather bulkhead)	4.8	0	0		
S4I	S4U		(none)	(weather bulkhead)	57.6	0	0		
S4U			01-58-2-L	EO STATEROOM	45.8	0	0		
S4U			01-68-0-L	PASSAGEWAY	64.5	0	0		
S4U			01-68-2-L	SANITARY SPACE	31.7	0	0		
S4U			01-68-4-L	WARDROOM STATEROOM	105.8	0	0	HS	X
			1-62-2-L	STAIRWAY	(CUI	= LP)			
S4U		S4U	1-47-0-L	PASSAGEWAY	22.4	0	0		
S4U		S4U	1-62-2-Q	SEABAG LKR	19.2	0	0		
000		000	1-63-0-L	PASASGEWAY	22.4	0	0		
000		000	1-63-0-L	PASASGEWAY	44.8	0	0		
S4U		S4U	1-65-2-Q	FOUL WEATHER AND LIF	25.6	0	0		
S4U			01-52-0-L	PASSAGEWAY	14.6	0	0	HS	X
			1-62-2-Q	SEABAG LKR	(CUI	= AG)			
S4U		S4U	1-47-0-L	PASSAGEWAY	12.8	0	0		
S4U		S4U	1-51-2-L	SANITARY SPACE	44.8	-90	-90		
S4U		S4I	1-61-2-L	CREWS BERTHING	17.6	-90	-90		
S4U		S4I	1-61-2-L	CREWS BERTHING	32	-90	-90	DJ	NC
S4U		S4U	1-62-2-L	STAIRWAY	19.2	0	0		
S4U		S4U	1-65-2-Q	FOUL WEATHER AND LIF	27.2	-90	-90		
S4U			01-63A-2-L	STAIRWAY	9.1	0	0		
S4U			01-52-0-L	PASSAGEWAY	15.2	0	0		
S4U			01-58-2-L	EO STATEROOM	7.2	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
			1-63-0-L	PASASGEWAY	(CUI	= LP)			
000		000	1-47-0-L	PASSAGEWAY	33.6	0	0		
S4U		S4U	1-58-1-L	CREWS LOCKER SPACE	59.2	0	0	DJ	NC
S4U		S4I	1-61-2-L	CREWS BERTHING	83.2	0	0	DJ	NC
S4U		S4I	1-61-2-L	CREWS BERTHING	33.6	0	0		
000		000	1-62-2-L	STAIRWAY	22.4	0	0		
000		000	1-62-2-L	STAIRWAY	44.8	0	0		
S4U		S4U	1-63-1	AC&WW TRUNK	9.6	0	0		
S4U		S4U	1-63-1	AC&WW TRUNK	16	0	0		
S4U		S4U	1-65-2-Q	FOUL WEATHER AND LIF	25.6	0	0	DJ	NC
S4U		NPI	1-73-1-Q	ENGINEERS OFFICE	78.4	0	0	DJ	NC
S4U		S4U	1-82-1-L	PASSAGEWAY	32	0	0		
S4U			01-52-0-L	PASSAGEWAY	25.7	0	0		
S4U			01-68-0-L	PASSAGEWAY	19.7	0	0		
S4U			01-68-0-L	PASSAGEWAY	50.3	0	0		
			1-63-1	AC&WW TRUNK	(CUI	= TH)			
S4U		S4U	1-58-1-L	CREWS LOCKER SPACE	19.2	0	0		
S4U		S4U	1-58-1-L	CREWS LOCKER SPACE	16	0	0		
S4U		S4U	1-61-1	VOID	28.8	0	0		
S4U		S4U	1-63-0-L	PASASGEWAY	9.6	0	0		
S4U		S4U	1-63-0-L	PASASGEWAY	16	0	0		
S4U			01-63-1	AC & WW TRUNK	7.2	0	0		
			1-65-2-Q	FOUL WEATHER AND LIFE VEST LKR	(CUI	= AG)			
S4U		S4I	1-61-2-L	CREWS BERTHING	27.2	0	0		
S4U		S4I	1-61-2-L	CREWS BERTHING	51.2	0	0		
S4U		S4U	1-62-2-L	STAIRWAY	25.6	0	0		
S4U		S4U	1-62-2-Q	SEABAG LKR	27.2	-90	-90		
S4U		S4U	1-63-0-L	PASASGEWAY	25.6	0	0	DJ	NC
S4U			01-63A-2-L	STAIRWAY	9.5	0	0		
S4U			01-52-0-L	PASSAGEWAY	9.5	0	0		
S4U			01-68-0-L	PASSAGEWAY	7.2	0	0		
S4U			01-68-2-L	SANITARY SPACE	5	0	0		
			1-73-1-Q	ENGINEERS OFFICE	(CUI	= QO)			
NPI		S4U	1-58-1-L	CREWS LOCKER SPACE	97.6	0	0		
NPI		S4U	1-63-0-L	PASASGEWAY	78.4	0	0	DJ	NC
NPI		NPI	1-82-3-Q	SHIP AND SUPPLY OFFI	107.2	0	0		
NPI	S4U		(none)	(weather bulkhead)	79	0	0		
S4U			01-68-0-L	PASSAGEWAY	25.5	0	0		
S4U			01-68-3-L	WARDROOM STATEROOM	77.3	0	0		
S4U			01-81-1-L	SANITARY SPACE	19.2	0	0		
S4U			01-82-1-L	PASSENGER STATEROOM	2.9	0	0		
			1-82-1-L	PASSAGEWAY	(CUI	= LP)			
S4U		S4U	1-63-0-L	PASASGEWAY	32	0	0		
S4U	S4U	S4U	1-82-2-Q	FORWARD REPAIR #2	65.6	0	0	DJ	NC
S4U		NPI	1-82-3-Q	SHIP AND SUPPLY OFFI	80	0	0	DJ	NC
S4U		NPI	1-82-3-Q	SHIP AND SUPPLY OFFI	52.8	0	0		
S4U	S4U	NPI	1-82-3-Q	SHIP AND SUPPLY OFFI	25.6	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U	S4U	S4U	1-82-4-Q	ENGINEERS WORKSHOP	67.2	0	0	DWT	X
S4U	S4U	S4U	1-90-2-Q	ELCTRICIANS WORKSHOP	38.4	0	0	DJ	NC
000		000	1-95-1-L	STAIRWAY	33.6	0	0		
S4U	S4U	S4U	1-95-1-Q	LIFE JACKET LOCKER	48	0	0	DJ	NC
S4U	S4U	S4U	1-95-1-Q	LIFE JACKET LOCKER	19.2	0	0		
S4U		S4U	1-95-1-Q	LIFE JACKET LOCKER	8	0	0		
S4U	S4U	S4U	1-96-1-L	PASSAGEWAY	25.6	0	0	DWT	X
S4U		S4U	1-103-1-L	PASSAGEWAY	32	0	0		
S4U			01-68-0-L	PASSAGEWAY	27.2	0	0		
S4U			01-82-1-L	PASSENGER STATEROOM	8	0	0		
S4U			01-85-0-L	WARDROOM STATEROOM	37	0	0		
S4U			01-98-0-L	PASSAGEWAY	31.8	0	0		
			1-82-2-Q	FORWARD REPAIR #2	(CUI	= QS)			
S4U	S4U	S4I	1-61-2-L	CREWS BERTHING	70.4	0	0		
S4U	S4U	S4U	1-82-1-L	PASSAGEWAY	65.6	0	0	DJ	NC
S4U		S4U	1-82-4-Q	ENGINEERS WORKSHOP	65.6	0	0		
S4U		S4U	1-90-2-Q	ELCTRICIANS WORKSHOP	13.6	0	0		
S4U		S4U	1-90-2-Q	ELCTRICIANS WORKSHOP	56.8	-15	-15		
S4U			01-68-0-L	PASSAGEWAY	26.4	0	0		
S4U			01-84-2-L	WARDROOM STATEROOM	8.4	0	0		
S4U			01-85-0-L	WARDROOM STATEROOM	31.2	0	0		
S4U			01-89-2-L	SANITARY SPACE	6.2	0	0		
			1-82-3-Q	SHIP AND SUPPLY OFFICE	(CUI	= QO)			
NPI		NPI	1-73-1-Q	ENGINEERS OFFICE	107.2	0	0		
NPI		S4U	1-82-1-L	PASSAGEWAY	80	0	0	DJ	NC
NPI		S4U	1-82-1-L	PASSAGEWAY	52.8	0	0		
NPI	S4U	S4U	1-82-1-L	PASSAGEWAY	25.6	0	0		
NPI	S4U	S4U	1-95-1-L	STAIRWAY	40	0	0		
NPI	S4U	S4U	1-96-1-L	PASSAGEWAY	59.2	0	0		
NPI	S4U		(none)	(weather bulkhead)	65.6	0	0		
NPI	S4U		(none)	(weather bulkhead)	4.8	0	0		
NPI	S4U		(none)	(weather bulkhead)	80	0	0		
S4U			01-68-0-L	PASSAGEWAY	26	0	0		
S4U			01-82-1-L	PASSENGER STATEROOM	129.8	0	0		
S4U			01-94-1-Q	WINCH MACH. SPACE	40	0	0		
			1-82-4-Q	ENGINEERS WORKSHOP	(CUI	= QS)			
S4U	S4U	S4I	1-61-2-L	CREWS BERTHING	60.8	0	0		
S4U	S4U	S4U	1-82-1-L	PASSAGEWAY	67.2	0	0	DWT	X
S4U		S4U	1-82-2-Q	FORWARD REPAIR #2	65.6	0	0		
S4U		S4U	1-90-2-Q	ELCTRICIANS WORKSHOP	18.4	0	0		
S4U		S4U	1-90-2-Q	ELCTRICIANS WORKSHOP	52	-15	-15		
S4U		S4U	1-90-2-Q	ELCTRICIANS WORKSHOP	38.4	-15	-15		
S4U	S4U	S4U	1-103-2-L	VESTIBULE	32	0	0		
S4U	S4U	S4U	1-103-4-A	ENGINEERS TOOL RM	40	0	0	DJ	NC
S4U	S4U	S4U	1-109-2	UPTAKE	73.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	171.8	0	0		
S4U			01-68-0-L	PASSAGEWAY	12	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U			01-68-4-L	WARDROOM STATEROOM	5.1	0	0		
S4U			01-84-2-L	WARDROOM STATEROOM	110.9	0	0		
S4U			01-85-0-L	WARDROOM STATEROOM	19.2	0	0		
S4U			01-89-2-L	SANITARY SPACE	4.2	0	0		
S4U			01-94-2-L	DECONTAMINATION SHOW	10.9	0	0		
S4U			01-98-0-L	PASSAGEWAY	89.4	0	0		
S4U			(none)	(weather overhead)	4.1	0	0		
			1-90-2-Q	ELCTRICIANS WORKSHOP	(CUI	= QS)			
S4U	S4U	S4U	1-82-1-L	PASSAGEWAY	38.4	0	0	DJ	NC
S4U		S4U	1-82-2-Q	FORWARD REPAIR #2	13.6	0	0		
S4U		S4U	1-82-2-Q	FORWARD REPAIR #2	56.8	-15	-15		
S4U		S4U	1-82-4-Q	ENGINEERS WORKSHOP	18.4	0	0		
S4U		S4U	1-82-4-Q	ENGINEERS WORKSHOP	52	-15	-15		
S4U		S4U	1-82-4-Q	ENGINEERS WORKSHOP	38.4	-15	-15		
S4U			01-85-0-L	WARDROOM STATEROOM	28.8	0	0		
S4U			01-89-2-L	SANITARY SPACE	13.4	0	0		
			1-95-1-L	STAIRWAY	(CUI	= LP)			
000		000	1-82-1-L	PASSAGEWAY	33.6	0	0		
S4U	S4U	NPI	1-82-3-Q	SHIP AND SUPPLY OFFI	40	0	0		
S4U	S4U	S4U	1-95-1-Q	LIFE JACKET LOCKER	40	0	0		
S4U		S4U	1-96-1-L	PASSAGEWAY	33.6	0	0		
S4U			01-94-1-Q	WINCH MACH. SPACE	4	0	0	HS	X
000		000	01-98-0-L	PASSAGEWAY	17	0	0		
			1-95-1-Q	LIFE JACKET LOCKER	(CUI	= AG)			
S4U	S4U	S4U	1-82-1-L	PASSAGEWAY	48	0	0	DJ	NC
S4U	S4U	S4U	1-82-1-L	PASSAGEWAY	19.2	0	0		
S4U		S4U	1-82-1-L	PASSAGEWAY	8	0	0		
S4U	S4U	S4U	1-95-1-L	STAIRWAY	40	0	0		
S4U	S4U	S4U	1-96-1-L	PASSAGEWAY	19.2	0	0		
S4U			01-98-0-L	PASSAGEWAY	14.4	0	0		
			1-96-1-L	PASSAGEWAY	(CUI	= LP)			
S4U	S4U	S4U	1-82-1-L	PASSAGEWAY	25.6	0	0	DWT	X
S4U	S4U	NPI	1-82-3-Q	SHIP AND SUPPLY OFFI	59.2	0	0		
S4U		S4U	1-95-1-L	STAIRWAY	33.6	0	0		
S4U	S4U	S4U	1-95-1-Q	LIFE JACKET LOCKER	19.2	0	0		
S4U		S4U	1-103-3-A	ELECTRONIC STORES	36.8	0	0	DJ	NC
S4U		S4U	1-110-1	UPTAKE	75.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	25.6	0	0	DWT	X
S4U			01-94-1-Q	WINCH MACH. SPACE	26.2	0	0		
S4U			01-98-0-L	PASSAGEWAY	18.6	0	0		
			1-103-1-L	PASSAGEWAY	(CUI	= LP)			
S4U		S4U	1-82-1-L	PASSAGEWAY	32	0	0		
S4U	S4U	S4U	1-103-2-L	VESTIBULE	70.4	0	0	DWT	X
S4U	S4U	S4U	1-110-1	UPTAKE	110.4	0	0		
S4U		S4U	1-113-2-L	PASSAGEWAY	40	0	0	DJ	NC
000		000	1-117-0-L	CREW MESS	32	0	0		
S4U			01-103-0-Q	AVIONICS SHOP	55.2	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
			1-103-2-L	VESTIBULE	(CUI	= LP)			
S4U	S4U	S4U	1-82-4-Q	ENGINEERS WORKSHOP	32	0	0		
S4U	S4U	S4U	1-103-1-L	PASSAGEWAY	70.4	0	0	DWT	X
S4U	S4U	S4U	1-109-2	UPTAKE	70.4	0	0		
S4U	S4U	S4U	1-113-2-L	PASSAGEWAY	32	0	0		
S4U			01-103-0-Q	AVIONICS SHOP	35.2	0	0	HS	X
			1-103-3-A	ELECTRONIC STORES	(CUI	= AS)			
S4U		S4U	1-96-1-L	PASSAGEWAY	36.8	0	0	DJ	NC
S4U	S4U	S4U	1-110-1	UPTAKE	110.4	0	0		
S4U	S4U	S4U	1-117-3-Q	RECREATION LKR	41.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	110.5	0	0		
S4U			(none)	(weather overhead)	67.6	0	0		
			1-103-4-A	ENGINEERS TOOL RM	(CUI	= AS)			
S4U	S4U	S4U	1-82-4-Q	ENGINEERS WORKSHOP	40	0	0	DJ	NC
S4U	S4U	S4U	1-109-2	UPTAKE	110.4	0	0		
S4U	S4U	NPI	1-117-2-L	WARDROOM	41.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	110.4	0	0		
S4U			(none)	(weather overhead)	70.4	0	0		
			1-109-2	UPTAKE	(CUI	= TU)			
S4U	S4U	S4U	1-82-4-Q	ENGINEERS WORKSHOP	73.6	0	0		
S4U	S4U	S4U	1-103-2-L	VESTIBULE	70.4	0	0		
S4U	S4U	S4U	1-103-4-A	ENGINEERS TOOL RM	110.4	0	0		
S4U	S4U	S4U	1-113-2-L	PASSAGEWAY	40	0	0		
S4U	S4U	NPI	1-117-2-L	WARDROOM	73.6	0	0		
S4U			01-103-2-Q	MACHINERY VENT PLENU	55.2	0	0		
S4U			01-109-2	UPTAKE	71.8	0	0		
			1-110-1	UPTAKE	(CUI	= TU)			
S4U		S4U	1-96-1-L	PASSAGEWAY	75.2	0	0		
S4U	S4U	S4U	1-103-1-L	PASSAGEWAY	110.4	0	0		
S4U	S4U	S4U	1-103-3-A	ELECTRONIC STORES	110.4	0	0		
S4U	S4U	S4U	1-117-1-Q	FAN ROOM	75.2	0	0		
S4U			01-103-1-Q	MACHINERY VENT PLENU	54.5	0	0		
S4U			01-110-1	UPTAKE	64.4	0	0		
			1-113-2-L	PASSAGEWAY	(CUI	= LP)			
S4U		S4U	1-103-1-L	PASSAGEWAY	40	0	0	DJ	NC
S4U	S4U	S4U	1-103-2-L	VESTIBULE	32	0	0		
S4U	S4U	S4U	1-109-2	UPTAKE	40	0	0		
S4U	S4U	NPI	1-117-2-L	WARDROOM	32	0	0	DWT	X
S4U			01-103-0-Q	AVIONICS SHOP	20	0	0		
			1-117-0-L	CREW MESS	(CUI	= LL)			
000		000	1-103-1-L	PASSAGEWAY	32	0	0		
NPI	S4U	S4U	1-117-1-Q	FAN ROOM	75.2	0	0	DWT	X
NPI	S4U	S4U	1-117-1-Q	FAN ROOM	57.6	0	0		
NPI	S4U	NPI	1-117-2-L	WARDROOM	32	0	0		
NPI	S4U	S4U	1-117-3-Q	RECREATION LKR	41.6	0	0	DJ	NC
NPI	S4U	S4U	1-121-2-Q	SHIP STORES	64	0	0	DJ	NC
NPI	S4U	NPI	1-129-2-Q	SCULLERY	96	0	0	DO	O

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
NPI		NPI	1-141-2-Q	GALLEY	192	0	0	DO	O
NPI	S4U	S4U	1-165-0-L	PASSAGEWAY	33.6	0	0	DWT	X
NPI	S4U	NPI	1-165-3-L	CPO LOUNGE	76.8	0	0		
NPI	S4U	S4U	3-165-1-Q	SERVICE ELEVATOR TRU	38.4	0	0	DWT	X
NPI	S4U		(none)	(weather bulkhead)	326.4	0	0		
S4U			01-117-0-Q	HELICOPTOR HANGER	154.2	0	0		
S4U			(none)	(weather overhead)	633.4	0	0	HS	X
			1-117-1-Q	FAN ROOM	(CUI	= QF)			
S4U	S4U	S4U	1-110-1	UPTAKE	75.2	0	0		
S4U	S4U	NPI	1-117-0-L	CREW MESS	75.2	0	0	DWT	X
S4U	S4U	NPI	1-117-0-L	CREW MESS	57.6	0	0		
S4U	S4U	S4U	1-117-3-Q	RECREATION LKR	57.6	0	0		
S4U			01-117-0-Q	HELICOPTOR HANGER	41.8	0	0		
S4U			(none)	(weather overhead)	25.9	0	0		
			1-117-2-L	WARDROOM	(CUI	= LL)			
NPI	S4U	S4U	1-103-4-A	ENGINEERS TOOL RM	41.6	0	0		
NPI	S4U	S4U	1-109-2	UPTAKE	73.6	0	0		
NPI	S4U	S4U	1-113-2-L	PASSAGEWAY	32	0	0	DWT	X
NPI	S4U	NPI	1-117-0-L	CREW MESS	32	0	0		
NPI	S4U	S4U	1-121-2-Q	SHIP STORES	64	0	0		
NPI	S4U	S4U	1-121-2-Q	SHIP STORES	44.8	0	0		
NPI	S4U	NPI	1-129-2-Q	SCULLERY	96	0	0		
NPI	S4U	NPI	1-129-2-Q	SCULLERY	19.2	0	0		
NPI	S4U	NPI	1-129-2-Q	SCULLERY	19.2	0	0		
NPI	S4U	NPI	1-141-2-Q	GALLEY	32	0	0	DWT	X
NPI	S4U	NPI	1-141-2-Q	GALLEY	97.6	0	0		
NPI	S4U		(none)	(weather bulkhead)	224	0	0		
NPI	S4U		(none)	(weather bulkhead)	4.8	0	0		
S4U			01-117-0-Q	HELICOPTOR HANGER	163.2	0	0		
S4U			(none)	(weather overhead)	188.8	0	0		
			1-117-3-Q	RECREATION LKR	(CUI	= AG)			
S4U	S4U	S4U	1-103-3-A	ELECTRONIC STORES	41.6	0	0		
S4U	S4U	NPI	1-117-0-L	CREW MESS	41.6	0	0	DJ	NC
S4U	S4U	S4U	1-117-1-Q	FAN ROOM	57.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	57.6	0	0		
S4U			(none)	(weather overhead)	37.4	0	0		
			1-121-2-Q	SHIP STORES	(CUI	= AS)			
S4U	S4U	NPI	1-117-0-L	CREW MESS	64	0	0	DJ	NC
S4U	S4U	NPI	1-117-2-L	WARDROOM	64	0	0		
S4U	S4U	NPI	1-117-2-L	WARDROOM	44.8	0	0		
S4U	S4U	NPI	1-129-2-Q	SCULLERY	44.8	0	0		
S4U			01-117-0-Q	HELICOPTOR HANGER	44.8	0	0		
			1-129-2-Q	SCULLERY	(CUI	= QG)			
NPI	S4U	NPI	1-117-0-L	CREW MESS	96	0	0	DO	O
NPI	S4U	NPI	1-117-2-L	WARDROOM	96	0	0		
NPI	S4U	NPI	1-117-2-L	WARDROOM	19.2	0	0		
NPI	S4U	NPI	1-117-2-L	WARDROOM	19.2	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
NPI	S4U	S4U	1-121-2-Q	SHIP STORES	44.8	0	0		
NPI	S4U	NPI	1-141-2-Q	GALLEY	44.8	0	0	DO	O
S4U			01-117-0-Q	HELICOPTOR HANGER	64	0	0		
S4U			(none)	(weather overhead)	32	0	0		
			1-141-2-Q	GALLEY	(CUI	= QG)			
NPI		NPI	1-117-0-L	CREW MESS	192	0	0	DO	O
NPI	S4U	NPI	1-117-2-L	WARDROOM	32	0	0	DWT	X
NPI	S4U	NPI	1-117-2-L	WARDROOM	97.6	0	0		
NPI	S4U	NPI	1-129-2-Q	SCULLERY	44.8	0	0	DO	O
NPI	S4U	NPI	1-165-2-L	CPO STATEROOM	68.8	0	0		
NPI	S4U	NPI	1-165-4-L	CPO STATEROOM	70.4	0	0		
NPI	S4U		(none)	(weather bulkhead)	160	0	0		
S4U			(none)	(weather overhead)	378.4	0	0		
			1-165-0-L	PASSAGEWAY	(CUI	= LP)			
S4U	S4U	NPI	1-117-0-L	CREW MESS	33.6	0	0	DWT	X
S4U		NPI	1-165-2-L	CPO STATEROOM	68.8	0	0	DJ	NC
S4U		NPI	1-165-3-L	CPO LOUNGE	112	0	0		
S4U		NPI	1-165-4-L	CPO STATEROOM	49.6	0	0	DJ	NC
S4U		S4U	3-165-1-Q	SERVICE ELEVATOR TRU	32	0	0		
S4U		S4U	1-169-1-L	MEDICAL STORES	30.4	0	0		
S4U		S4U	1-169-1-L	MEDICAL STORES	17.6	0	0		
S4U		S4U	1-169-1-L	MEDICAL STORES	11.2	0	0		
S4U		S4U	1-169-1-L	MEDICAL STORES	20.8	0	0	DJ	NC
S4U		S4U	1-174-2-L	SANITARY SPACE	59.2	0	0	DJ	NC
S4U		S4U	1-174-2-L	SANITARY SPACE	24	0	0		
S4U		NPI	1-177-0-L	CPO STATEROOM	68.8	0	0	DJ	NC
S4U		NPI	1-177-0-L	CPO STATEROOM	70.4	0	0		
S4U		S4U	1-179-1-L	DISPENSARY	56	0	0	DJ	NC
S4U	S4U	S4U	1-186-0-A	ENGINEERS STORES	28.8	0	0		
S4U		S4U	1-186-0-L	PASSAGEWAY	33.6	0	0	DWT	X
S4U			(none)	(weather overhead)	181.8	0	0	HS	X
			1-165-2-L	CPO STATEROOM	(CUI	= L2)			
NPI	S4U	NPI	1-141-2-Q	GALLEY	68.8	0	0		
NPI		S4U	1-165-0-L	PASSAGEWAY	68.8	0	0	DJ	NC
NPI		NPI	1-165-4-L	CPO STATEROOM	73.6	0	0		
NPI		S4U	3-165-1-Q	SERVICE ELEVATOR TRU	32	0	0	DJ	NC
NPI		S4U	1-169-1-L	MEDICAL STORES	41.6	0	0		
S4U			(none)	(weather overhead)	79.1	0	0		
			1-165-3-L	CPO LOUNGE	(CUI	= LL)			
NPI	S4U	NPI	1-117-0-L	CREW MESS	76.8	0	0		
NPI		S4U	1-165-0-L	PASSAGEWAY	112	0	0		
NPI		S4U	1-179-1-L	DISPENSARY	75.2	0	0		
NPI	S4U		(none)	(weather bulkhead)	112	0	0		
S4U			(none)	(weather overhead)	133	0	0	HS	X
			1-165-4-L	CPO STATEROOM	(CUI	= L2)			
NPI	S4U	NPI	1-141-2-Q	GALLEY	70.4	0	0		
NPI		S4U	1-165-0-L	PASSAGEWAY	49.6	0	0	DJ	NC

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
NPI		NPI	1-165-2-L	CPO STATEROOM	73.6	0	0		
NPI		S4U	1-174-2-L	SANITARY SPACE	20.8	-90	-90		
NPI	S4U		(none)	(weather bulkhead)	73.6	0	0		
S4U			(none)	(weather overhead)	81	0	0		
			3-165-1-Q	SERVICE ELEVATOR TRUNK	(CUI	= TH)			
S4U	S4U	NPI	1-117-0-L	CREW MESS	38.4	0	0	DWT	X
S4U		S4U	1-165-0-L	PASSAGEWAY	32	0	0		
S4U		NPI	1-165-2-L	CPO STATEROOM	32	0	0	DJ	NC
S4U		S4U	1-169-1-L	MEDICAL STORES	38.4	0	0		
S4U		S4U	4-65-1-F	FUEL TANK	28	0	0		
S4U		S4I	3-152A-0-E	ENGINE ROOM EXT	26.4	0	0		
S4U		S4U	4-165-4-F	DIESEL OIL TANK	28	0	0		
S4U	S4U	S4U	3-169-2-A	STOREROOM	33.6	0	0	DWT	X
S4U	S4U	S4I	3-152-0-E	ENGINEERING CONTROL	38.4	0	0		
S4U		S4I	3-152-0-E	ENGINEERING CONTROL	7.2	0	0		
S4U		S4U	2-165-0-L	SANITARY SPACE	38.4	0	0		
S4U		S4U	2-165-0-L	SANITARY SPACE	32	0	0		
S4U		S4U	2-165-1-Q	SEABAG LKR	25.6	0	0		
S4U		S4I	2-165-3-L	CREW BERTHING AREA	32	0	0		
S4U	S4U		(none)	(weather bulkhead)	25.6	0	0		
S4U			(none)	(weather overhead)	19.2	0	0		
			1-169-1-L	MEDICAL STORES	(CUI	= AS)			
S4U		S4U	1-165-0-L	PASSAGEWAY	30.4	0	0		
S4U		S4U	1-165-0-L	PASSAGEWAY	17.6	0	0		
S4U		S4U	1-165-0-L	PASSAGEWAY	11.2	0	0		
S4U		S4U	1-165-0-L	PASSAGEWAY	20.8	0	0	DJ	NC
S4U		NPI	1-165-2-L	CPO STATEROOM	41.6	0	0		
S4U		S4U	3-165-1-Q	SERVICE ELEVATOR TRU	38.4	0	0		
S4U			(none)	(weather overhead)	21.9	0	0		
			1-174-2-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4U	1-165-0-L	PASSAGEWAY	59.2	0	0	DJ	NC
S4U		S4U	1-165-0-L	PASSAGEWAY	24	0	0		
S4U		NPI	1-165-4-L	CPO STATEROOM	20.8	-90	-90		
S4U		NPI	1-177-0-L	CPO STATEROOM	70.4	0	0		
S4U	S4U	S4U	1-186-2-Q	COMPUTER ROOM	36.8	0	0		
S4U		S4U	1-186-4-L	SANITARY SPACE	43.2	-90	-90		
S4U	S4U		(none)	(weather bulkhead)	94.4	0	0		
S4U			(none)	(weather overhead)	95.8	0	0		
			1-177-0-L	CPO STATEROOM	(CUI	= L2)			
NPI		S4U	1-165-0-L	PASSAGEWAY	68.8	0	0	DJ	NC
NPI		S4U	1-165-0-L	PASSAGEWAY	70.4	0	0		
NPI		S4U	1-174-2-L	SANITARY SPACE	70.4	0	0		
NPI	S4U	S4U	1-186-0-A	ENGINEERS STORES	22.4	0	0		
NPI	S4U	S4U	1-186-2-Q	COMPUTER ROOM	46.4	0	0		
S4U			(none)	(weather overhead)	75.7	0	0		
			1-179-1-L	DISPENSARY	(CUI	= LM)			
S4U		S4U	1-165-0-L	PASSAGEWAY	56	0	0	DJ	NC

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U		NPI	1-165-3-L	CPO LOUNGE	75.2	0	0		
S4U	S4U	NPI	1-186-3-Q	TRASH COMPACTOR SPAC	75.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	56	0	0		
S4U			(none)	(weather overhead)	65.8	0	0		
			1-186-0-A	ENGINEERS STORES	(CUI	= AS)			
S4U	S4U	S4U	1-165-0-L	PASSAGEWAY	28.8	0	0		
S4U	S4U	NPI	1-177-0-L	CPO STATEROOM	22.4	0	0		
S4U	S4U	S4U	1-186-0-L	PASSAGEWAY	51.2	0	0	DWT	X
S4U	S4U	S4U	1-186-0-L	PASSAGEWAY	73.6	0	0		
S4U		S4U	1-186-2-Q	COMPUTER ROOM	73.6	0	0		
S4U			(none)	(weather overhead)	58.9	0	0		
			1-186-0-L	PASSAGEWAY	(CUI	= LP)			
S4U		S4U	1-165-0-L	PASSAGEWAY	33.6	0	0	DWT	X
S4U	S4U	S4U	1-186-0-A	ENGINEERS STORES	51.2	0	0	DWT	X
S4U	S4U	S4U	1-186-0-A	ENGINEERS STORES	73.6	0	0		
S4U	S4U	S4U	1-186-2-Q	COMPUTER ROOM	83.2	0	0	DWT	X
S4U	S4U	NPI	1-186-3-Q	TRASH COMPACTOR SPAC	112	0	0	DWT	X
S4U		S4U	1-186-4-L	SANITARY SPACE	32	0	0	DJ	NC
S4U		S4U	1-186-4-L	SANITARY SPACE	6.4	0	0		
S4U		NPI	1-199-0-L	CPO STATEROOM	72	0	0	DJ	NC
S4U		NPI	1-199-0-L	CPO STATEROOM	48	0	0		
S4U		NPI	1-199-2-L	CPO STATEROOM	36.8	0	0	DJ	NC
S4U		S4U	1-201-1-Q	LIFE JACKET LCKR	56	0	0	DJ	NC
S4U		S4U	1-205-1-Q	FOUL WEATHER LIFE VE	14.4	0	0	DJ	NC
S4U		S4U	1-205-1-Q	FOUL WEATHER LIFE VE	28.8	-90	-90		
S4U	S4U	S4U	1-207-1-L	VESTIBULE	33.6	0	0	DWT	X
S4U			(none)	(weather overhead)	183.3	0	0	HS	X
			1-186-2-Q	COMPUTER ROOM	(CUI	= QA)			
S4U	S4U	S4U	1-174-2-L	SANITARY SPACE	36.8	0	0		
S4U	S4U	NPI	1-177-0-L	CPO STATEROOM	46.4	0	0		
S4U		S4U	1-186-0-A	ENGINEERS STORES	73.6	0	0		
S4U	S4U	S4U	1-186-0-L	PASSAGEWAY	83.2	0	0	DWT	X
S4U	S4U	S4U	1-186-4-L	SANITARY SPACE	73.6	0	0		
S4U			(none)	(weather overhead)	95.7	0	0		
			1-186-3-Q	TRASH COMPACTOR SPACE	(CUI	= QG)			
NPI	S4U	S4U	1-179-1-L	DISPENSARY	75.2	0	0		
NPI	S4U	S4U	1-186-0-L	PASSAGEWAY	112	0	0	DWT	X
NPI	S4U	S4U	1-201-1-Q	LIFE JACKET LCKR	56	0	0		
NPI	S4U	S4U	1-201-1-Q	LIFE JACKET LCKR	20.8	0	0		
NPI		S4U	1-207-3-J	JP-5 FUELING	22.4	0	0		
NPI	S4U		(none)	(weather bulkhead)	168.5	0	0		
NPI	S4U		(none)	(weather bulkhead)	19.2	0	0		
S4U			(none)	(weather overhead)	162.4	0	0		
			1-186-4-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4U	1-174-2-L	SANITARY SPACE	43.2	-90	-90		
S4U		S4U	1-186-0-L	PASSAGEWAY	32	0	0	DJ	NC
S4U		S4U	1-186-0-L	PASSAGEWAY	6.4	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U	S4U	S4U	1-186-2-Q	COMPUTER ROOM	73.6	0	0		
S4U		NPI	1-199-2-L	CPO STATEROOM	33.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	60.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	44.8	0	0		
S4U			(none)	(weather overhead)	65	0	0		
			1-199-0-L	CPO STATEROOM	(CUI	= L2)			
NPI		S4U	1-186-0-L	PASSAGEWAY	72	0	0	DJ	NC
NPI		S4U	1-186-0-L	PASSAGEWAY	48	0	0		
NPI		NPI	1-199-2-L	CPO STATEROOM	62.4	0	0		
NPI		S4U	1-205-1-Q	FOUL WEATHER LIFE VE	14.4	0	0		
NPI	S4U	S4U	1-207-1-L	VESTIBULE	6.4	0	0		
NPI	S4U	S4U	1-207-2-Q	FAN ROOM	33.6	0	0		
NPI	S4U		(none)	(weather bulkhead)	32	0	0		
S4U			(none)	(weather overhead)	70.2	0	0		
			1-199-2-L	CPO STATEROOM	(CUI	= L2)			
NPI		S4U	1-186-0-L	PASSAGEWAY	36.8	0	0	DJ	NC
NPI		S4U	1-186-4-L	SANITARY SPACE	33.6	0	0		
NPI		NPI	1-199-0-L	CPO STATEROOM	62.4	0	0		
NPI	S4U		(none)	(weather bulkhead)	70.4	0	0		
NPI	S4U		(none)	(weather bulkhead)	62.4	0	0		
S4U			(none)	(weather overhead)	68.6	0	0		
			1-201-1-Q	LIFE JACKET LCKR	(CUI	= AG)			
S4U		S4U	1-186-0-L	PASSAGEWAY	56	0	0	DJ	NC
S4U	S4U	NPI	1-186-3-Q	TRASH COMPACTOR SPAC	56	0	0		
S4U	S4U	NPI	1-186-3-Q	TRASH COMPACTOR SPAC	20.8	0	0		
S4U	S4U	S4U	1-207-3-J	JP-5 FUELING	20.8	0	0		
S4U			(none)	(weather overhead)	18.2	0	0		
			1-205-1-Q	FOUL WEATHER LIFE VEST LKR	(CUI	= AG)			
S4U		S4U	1-186-0-L	PASSAGEWAY	14.4	0	0	DJ	NC
S4U		S4U	1-186-0-L	PASSAGEWAY	28.8	-90	-90		
S4U		NPI	1-199-0-L	CPO STATEROOM	14.4	0	0		
S4U	S4U	S4U	1-207-1-L	VESTIBULE	28.8	0	0		
S4U			(none)	(weather overhead)	6.5	0	0		
			1-207-1-L	VESTIBULE	(CUI	= LP)			
S4U	S4U	S4U	1-186-0-L	PASSAGEWAY	33.6	0	0	DWT	X
S4U	S4U	NPI	1-199-0-L	CPO STATEROOM	6.4	0	0		
S4U	S4U	S4U	1-205-1-Q	FOUL WEATHER LIFE VE	28.8	0	0		
S4U	S4U	S4U	1-207-2-Q	FAN ROOM	32	0	0		
S4U	S4U	S4U	1-207-3-J	JP-5 FUELING	57.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	68.8	0	0	DWT	X
S4U	S4U		(none)	(weather bulkhead)	25.6	0	0		
S4U			(none)	(weather overhead)	61.9	0	0	HS	X
			1-207-2-Q	FAN ROOM	(CUI	= QF)			
S4U	S4U	NPI	1-199-0-L	CPO STATEROOM	33.6	0	0		
S4U	S4U	S4U	1-207-1-L	VESTIBULE	32	0	0		
S4U	S4U		(none)	(weather bulkhead)	32	0	0	DWT	X
S4U	S4U		(none)	(weather bulkhead)	33.6	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U			(none)	(weather overhead)	16.8	0	0		
			1-207-3-J	JP-5 FUELING	(CUI	= QA)			
S4U		NPI	1-186-3-Q	TRASH COMPACTOR SPAC	22.4	0	0		
S4U	S4U	S4U	1-201-1-Q	LIFE JACKET LCKR	20.8	0	0		
S4U	S4U	S4U	1-207-1-L	VESTIBULE	57.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	57.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	46.4	0	0	DWT	X
S4U			(none)	(weather overhead)	41.8	0	0		
			01-63A-2-L	STAIRWAY	(CUI	= LP)			
S4U		S4U	01-52-0-L	PASSAGEWAY	41.6	0	0		
S4U		S4U	01-52-0-L	PASSAGEWAY	32	0	0		
S4U		NPI	01-58-2-L	EO STATEROOM	41.6	0	0		
S4U		S4U	01-68-0-L	PASSAGEWAY	17.6	0	0		
S4U		S4U	01-68-2-L	SANITARY SPACE	14.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	41.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	32	0	0	DJ	NC
S4U	S4U		(none)	(weather bulkhead)	41.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	45.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	14.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	41.6	0	0		
S4U			1-62-2-Q	SEABAG LKR	9.1	0	0		
S4U			1-65-2-Q	FOUL WEATHER AND LIF	9.5	0	0		
S4U			02-65A-4-L	STAIRWAY	3.5	0	0		
S4U			02-63-2-L	PASSAGEWAY	20.8	0	0		
S4U			02-65-2-L	STAIRWAY	9.6	0	0		
			01-47-1-L	VESTIBULE	(CUI	= LP)			
S4U		NPI	01-47-2-L	XO STATEROOM	30.4	0	0		
S4U		S4U	01-47-3-L	SANITARY SPACE	30.4	0	0		
S4U		S4U	01-52-0-L	PASSAGEWAY	22.4	0	0	DWT	X
S4U	S4U		(none)	(weather bulkhead)	25.6	0	0	DWT	X
S4U	S4U		(none)	(weather bulkhead)	8	0	0		
S4U	S4U		(none)	(weather bulkhead)	8	0	0		
S4U			1-47-1-Q	LAUNDRY	14.8	0	0		
S4U			02-45-0-Q	FAN SPACE	15.4	0	0		
			01-47-2-L	XO STATEROOM	(CUI	= L1)			
NPI		S4U	01-47-1-L	VESTIBULE	30.4	0	0		
NPI		S4U	01-47-4-L	SANITARY SPACE	76.8	-90	-90		
NPI		S4U	01-52-0-L	PASSAGEWAY	49.6	0	0		
NPI		S4U	01-52-0-L	PASSAGEWAY	64	0	0	DJ	NC
NPI		NPI	01-58-2-L	EO STATEROOM	16	0	0		
NPI	S4U		(none)	(weather bulkhead)	80	0	0		
S4U			1-47-0-L	PASSAGEWAY	55.9	0	0		
S4U			1-51-2-L	SANITARY SPACE	44.1	0	0		
S4U			02-45-0-Q	FAN SPACE	100	0	0		
			01-47-3-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4U	01-47-1-L	VESTIBULE	30.4	0	0		
S4U		NPI	01-47-5-L	CO STATEROOM	28.8	-90	-90		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U		NPI	01-47-5-L	CO STATEROOM	24	-90	-90		
S4U		NPI	01-47-5-L	CO STATEROOM	25.6	-90	-90	DJ	NC
S4U		S4U	01-52-0-L	PASSAGEWAY	24	0	0		
S4U		S4U	01-55-1	VENT SHAFT	28.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	49.6	0	0		
S4U			1-47-1-Q	LAUNDRY	32.6	0	0		
S4U			02-45-0-Q	FAN SPACE	32.6	0	0		
			01-47-4-L	SANITARY SPACE	(CUI	= LW)			
S4U		NPI	01-47-2-L	XO STATEROOM	76.8	-90	-90		
S4U		NPI	01-58-2-L	EO STATEROOM	60.8	-90	-90	DJ	NC
S4U	S4U		(none)	(weather bulkhead)	64.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	36	0	0		
S4U			1-47-0-L	PASSAGEWAY	3.2	0	0	HS	X
S4U			1-51-2-L	SANITARY SPACE	32.3	0	0		
S4U			02-45-0-Q	FAN SPACE	30	0	0		
S4U			(none)	(weather overhead)	14.8	0	0		
			01-47-5-L	CO STATEROOM	(CUI	= L1)			
NPI		S4U	01-47-3-L	SANITARY SPACE	28.8	-90	-90		
NPI		S4U	01-47-3-L	SANITARY SPACE	24	-90	-90		
NPI		S4U	01-47-3-L	SANITARY SPACE	25.6	-90	-90	DJ	NC
NPI		S4U	01-55-1	VENT SHAFT	46.4	0	0		
NPI		S4U	01-61-1	VOID	8	0	0		
NPI		NPI	01-61-1-Q	CO OFFICE	86.4	-90	-90	DJ	NC
NPI	S4U		(none)	(weather bulkhead)	59.2	0	0		
NPI	S4U		(none)	(weather bulkhead)	73.6	0	0		
NPI	S4U		(none)	(weather bulkhead)	8	0	0		
S4U			1-47-1-Q	LAUNDRY	58	0	0		
S4U			1-58-1-L	CREWS LOCKER SPACE	34.7	0	0		
S4U			02-45-0-Q	FAN SPACE	85.8	0	0		
S4U			(none)	(weather overhead)	30.4	0	0		
			01-52-0-L	PASSAGEWAY	(CUI	= LP)			
S4U		S4U	01-63A-2-L	STAIRWAY	41.6	0	0		
S4U		S4U	01-63A-2-L	STAIRWAY	32	0	0		
S4U		S4U	01-47-1-L	VESTIBULE	22.4	0	0	DWT	X
S4U		NPI	01-47-2-L	XO STATEROOM	49.6	0	0		
S4U		NPI	01-47-2-L	XO STATEROOM	64	0	0	DJ	NC
S4U		S4U	01-47-3-L	SANITARY SPACE	24	0	0		
S4U		S4U	01-55-1	VENT SHAFT	46.4	0	0		
S4U		NPI	01-58-2-L	EO STATEROOM	78.4	0	0	DJ	NC
S4U		S4U	01-61-1	VOID	16	0	0		
S4U		NPI	01-61-1-Q	CO OFFICE	25.6	0	0	DJ	NC
S4U		S4U	01-63-1	AC & WW TRUNK	28.8	0	0		
S4U		S4U	01-63-1	AC & WW TRUNK	16	0	0		
S4U		S4U	01-68-0-L	PASSAGEWAY	28.8	0	0	DWT	X
S4U		S4U	01-68-0-L	PASSAGEWAY	72	0	0		
S4U		S4U	01-68-2-L	SANITARY SPACE	14.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	17.6	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U	S4U		(none)	(weather bulkhead)	14.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	41.6	0	0		
S4U			1-47-0-L	PASSAGEWAY	32.2	0	0		
S4U			1-51-2-L	SANITARY SPACE	11.4	0	0		
S4U			1-53-1-Q	MOVIE LKR	8.4	0	0		
S4U			1-56-1-Q	LOCKER	9	0	0		
S4U			1-58-1-L	CREWS LOCKER SPACE	7.7	0	0		
S4U			1-62-2-L	STAIRWAY	14.6	0	0	HS	X
S4U			1-62-2-Q	SEABAG LKR	15.2	0	0		
S4U			1-63-0-L	PASASGEWAY	25.7	0	0		
S4U			1-65-2-Q	FOUL WEATHER AND LIF	9.5	0	0		
S4U			02-65A-4-L	STAIRWAY	4.2	0	0		
S4U			02-45-0-Q	FAN SPACE	62.7	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	48.5	0	0	HS	X
S4U			02-63-2-L	PASSAGEWAY	23.5	0	0		
S4U			02-65-2-L	STAIRWAY	11.4	0	0		
			01-55-1	VENT SHAFT	(CUI	= TH)			
S4U		S4U	01-47-3-L	SANITARY SPACE	28.8	0	0		
S4U		NPI	01-47-5-L	CO STATEROOM	46.4	0	0		
S4U		S4U	01-52-0-L	PASSAGEWAY	46.4	0	0		
S4U		S4U	01-61-1	VOID	28.8	0	0		
S4U			1-55-1	VENT SHAFT	20.9	0	0		
S4U			02-55-1	VENT SHAFT	20.9	0	0		
			01-58-2-L	EO STATEROOM	(CUI	= L1)			
NPI		S4U	01-63A-2-L	STAIRWAY	41.6	0	0		
NPI		NPI	01-47-2-L	XO STATEROOM	16	0	0		
NPI		S4U	01-47-4-L	SANITARY SPACE	60.8	-90	-90	DJ	NC
NPI		S4U	01-52-0-L	PASSAGEWAY	78.4	0	0	DJ	NC
NPI		S4U	01-68-2-L	SANITARY SPACE	12.8	0	0		
NPI		NPI	01-68-4-L	WARDROOM STATEROOM	64	0	0		
NPI	S4U		(none)	(weather bulkhead)	81.6	0	0		
NPI	S4U		(none)	(weather bulkhead)	41.6	0	0		
S4U			1-51-2-L	SANITARY SPACE	24.7	0	0		
S4U			1-61-2-L	CREWS BERTHING	45.8	0	0		
S4U			1-62-2-Q	SEABAG LKR	7.2	0	0		
S4U			02-65A-4-L	STAIRWAY	2.6	0	0		
S4U			02-45-0-Q	FAN SPACE	25.9	0	0		
S4U			02-63-2-L	PASSAGEWAY	33.1	0	0		
S4U			(none)	(weather overhead)	35.5	0	0		
			01-61-1	VOID	(CUI	= V)			
S4U		NPI	01-47-5-L	CO STATEROOM	8	0	0		
S4U		S4U	01-52-0-L	PASSAGEWAY	16	0	0		
S4U		S4U	01-55-1	VENT SHAFT	28.8	0	0		
S4U		NPI	01-61-1-Q	CO OFFICE	8	0	0		
S4U		S4U	01-63-1	AC & WW TRUNK	28.8	0	0		
S4U			1-61-1	VOID	7.2	0	0		
S4U			02-45-0-Q	FAN SPACE	5.8	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
			01-61-1-Q	CO OFFICE	(CUI	= QO)			
NPI		NPI	01-47-5-L	CO STATEROOM	86.4	-90	-90	DJ	NC
NPI		S4U	01-52-0-L	PASSAGEWAY	25.6	0	0	DJ	NC
NPI		S4U	01-61-1	VOID	8	0	0		
NPI		S4U	01-63-1	AC & WW TRUNK	16	0	0		
NPI		NPI	01-68-3-L	WARDROOM STATEROOM	88	0	0		
NPI	S4U		(none)	(weather bulkhead)	49.6	0	0		
S4U			1-58-1-L	CREWS LOCKER SPACE	55.2	0	0		
S4U			02-45-0-Q	FAN SPACE	4.4	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	41.8	0	0		
S4U			(none)	(weather overhead)	23.2	0	0		
			01-63-1	AC & WW TRUNK	(CUI	= TH)			
S4U		S4U	01-52-0-L	PASSAGEWAY	28.8	0	0		
S4U		S4U	01-52-0-L	PASSAGEWAY	16	0	0		
S4U		S4U	01-61-1	VOID	28.8	0	0		
S4U		NPI	01-61-1-Q	CO OFFICE	16	0	0		
S4U			1-63-1	AC&WW TRUNK	7.2	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	7.2	0	0		
			01-68-0-L	PASSAGEWAY	(CUI	= LP)			
S4U		S4U	01-63A-2-L	STAIRWAY	17.6	0	0		
S4U		S4U	01-52-0-L	PASSAGEWAY	28.8	0	0	DWT	X
S4U		S4U	01-52-0-L	PASSAGEWAY	72	0	0		
S4U			(none)	(weather bulkhead)	57.6	0	0	DJ	NC
								DJ	NC
S4U			(none)	(weather bulkhead)	12.8	0	0		
S4U			(none)	(weather bulkhead)	14.4	0	0		
S4U			(none)	(weather bulkhead)	99.2	0	0		
S4U		S4U	01-68-2-L	SANITARY SPACE	86.4	-90	-90	DJ	NC
S4U		NPI	01-68-3-L	WARDROOM STATEROOM	102.4	0	0	DJ	NC
S4U		NPI	01-68-4-L	WARDROOM STATEROOM	52.8	0	0	DJ	NC
S4U		NPI	01-68-4-L	WARDROOM STATEROOM	11.2	0	0		
S4U		NPI	01-68-4-L	WARDROOM STATEROOM	25.6	0	0		
S4U		NPI	01-82-1-L	PASSENGER STATEROOM	104	0	0	DJ	NC
S4U		NPI	01-84-2-L	WARDROOM STATEROOM	12.8	0	0		
S4U		NPI	01-84-2-L	WARDROOM STATEROOM	54.4	0	0	DJ	NC
S4U		NPI	01-85-0-L	WARDROOM STATEROOM	70.4	0	0	DJ	NC
S4U		NPI	01-85-0-L	WARDROOM STATEROOM	70.4	0	0		
S4U		S4U	01-98-0-L	PASSAGEWAY	30.4	0	0	DJ	NC
S4U	S4U		(none)	(weather bulkhead)	17.6	0	0		
S4U			1-58-1-L	CREWS LOCKER SPACE	10.9	0	0		
S4U			1-61-2-L	CREWS BERTHING	64.5	0	0		
S4U			1-63-0-L	PASASGEWAY	19.7	0	0		
S4U			1-63-0-L	PASASGEWAY	50.3	0	0		
S4U			1-65-2-Q	FOUL WEATHER AND LIF	7.2	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U			1-73-1-Q	ENGINEERS OFFICE	25.5	0	0		
S4U			1-82-1-L	PASSAGEWAY	27.2	0	0		
S4U			1-82-2-Q	FORWARD REPAIR #2	26.4	0	0		
S4U			1-82-3-Q	SHIP AND SUPPLY OFFI	26	0	0		
S4U			1-82-4-Q	ENGINEERS WORKSHOP	12	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	147.7	0	0	HS	X
S4U			02-63-0-Q	SENSOR ROOM AND COMM	105.8	0	0		
S4U			02-63-2-L	PASSAGEWAY	17.3	0	0		
			01-68-2-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4U	01-63A-2-L	STAIRWAY	14.4	0	0		
S4U		S4U	01-52-0-L	PASSAGEWAY	14.4	0	0		
S4U		NPI	01-58-2-L	EO STATEROOM	12.8	0	0		
S4U		S4U	01-68-0-L	PASSAGEWAY	86.4	-90	-90	DJ	NC
S4U		NPI	01-68-4-L	WARDROOM STATEROOM	86.4	-90	-90	DJ	NC
S4U		NPI	01-68-4-L	WARDROOM STATEROOM	27.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	14.4	0	0		
S4U			1-61-2-L	CREWS BERTHING	31.7	0	0		
S4U			1-65-2-Q	FOUL WEATHER AND LIF	5	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	12.2	0	0		
S4U			02-63-2-L	PASSAGEWAY	20	0	0		
S4U			02-72-2-L	SANITARY SPACE	4.5	0	0		
			01-68-3-L	WARDROOM STATEROOM	(CUI	= L1)			
NPI		NPI	01-61-1-Q	CO OFFICE	88	0	0		
NPI		S4U	01-68-0-L	PASSAGEWAY	102.4	0	0	DJ	NC
NPI		S4U	01-81-1-L	SANITARY SPACE	9.6	0	0		
NPI		S4U	01-81-1-L	SANITARY SPACE	64	-90	-90	DJ	NC
NPI		NPI	01-82-1-L	PASSENGER STATEROOM	19.2	0	0		
NPI	S4U		(none)	(weather bulkhead)	92.8	0	0		
NPI	S4U		(none)	(weather bulkhead)	6.4	0	0		
S4U			1-58-1-L	CREWS LOCKER SPACE	39.2	0	0		
S4U			1-73-1-Q	ENGINEERS OFFICE	77.3	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	89.6	0	0		
S4U			(none)	(weather overhead)	43.2	0	0		
			01-68-4-L	WARDROOM STATEROOM	(CUI	= L2)			
NPI		NPI	01-58-2-L	EO STATEROOM	64	0	0		
NPI		S4U	01-68-0-L	PASSAGEWAY	52.8	0	0	DJ	NC
NPI		S4U	01-68-0-L	PASSAGEWAY	11.2	0	0		
NPI		S4U	01-68-0-L	PASSAGEWAY	25.6	0	0		
NPI		S4U	01-68-2-L	SANITARY SPACE	86.4	-90	-90	DJ	NC
NPI		S4U	01-68-2-L	SANITARY SPACE	27.2	0	0		
NPI		NPI	01-84-2-L	WARDROOM STATEROOM	44.8	0	0		
NPI	S4U		(none)	(weather bulkhead)	123.4	0	0		
S4U			1-61-2-L	CREWS BERTHING	105.8	0	0	HS	X
S4U			1-82-4-Q	ENGINEERS WORKSHOP	5.1	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	44.8	0	0		
S4U			02-63-2-L	PASSAGEWAY	18.1	0	0		
S4U			02-72-2-L	SANITARY SPACE	14.7	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U			(none)	(weather overhead)	58.1	0	0		
			01-81-1-L	SANITARY SPACE	(CUI	= LW)			
S4U		NPI	01-68-3-L	WARDROOM STATEROOM	9.6	0	0		
S4U		NPI	01-68-3-L	WARDROOM STATEROOM	64	-90	-90	DJ	NC
S4U		NPI	01-82-1-L	PASSENGER STATEROOM	64	-90	-90	DJ	NC
S4U		NPI	01-82-1-L	PASSENGER STATEROOM	9.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	19.2	0	0		
S4U			1-73-1-Q	ENGINEERS OFFICE	19.2	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	12.6	0	0		
S4U			(none)	(weather overhead)	6.6	0	0		
			01-82-1-L	PASSENGER STATEROOM	(CUI	= L1)			
NPI		S4U	01-68-0-L	PASSAGEWAY	104	0	0	DJ	NC
NPI		NPI	01-68-3-L	WARDROOM STATEROOM	19.2	0	0		
NPI		S4U	01-81-1-L	SANITARY SPACE	64	-90	-90	DJ	NC
NPI		S4U	01-81-1-L	SANITARY SPACE	9.6	0	0		
NPI		S4U	01-94-1-Q	WINCH MACH. SPACE	65.6	0	0		
NPI		S4U	01-98-0-L	PASSAGEWAY	8	0	0		
NPI		S4U	01-98-0-L	PASSAGEWAY	25.6	0	0		
NPI	S4U		(none)	(weather bulkhead)	102.4	0	0		
NPI	S4U		(none)	(weather bulkhead)	8	0	0		
S4U			1-73-1-Q	ENGINEERS OFFICE	2.9	0	0		
S4U			1-82-1-L	PASSAGEWAY	8	0	0		
S4U			1-82-3-Q	SHIP AND SUPPLY OFFI	129.8	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	100	0	0		
S4U			(none)	(weather overhead)	45.6	0	0		
			01-84-2-L	WARDROOM STATEROOM	(CUI	= L2)			
NPI		S4U	01-68-0-L	PASSAGEWAY	12.8	0	0		
NPI		S4U	01-68-0-L	PASSAGEWAY	54.4	0	0	DJ	NC
NPI		NPI	01-68-4-L	WARDROOM STATEROOM	44.8	0	0		
NPI		NPI	01-85-0-L	WARDROOM STATEROOM	24	0	0		
NPI		S4U	01-89-2-L	SANITARY SPACE	27.2	0	0		
NPI		S4U	01-89-2-L	SANITARY SPACE	56	0	0	DJ	NC
NPI		S4U	01-94-2-L	DECONTAMINATION SHOW	25.6	0	0		
NPI		S4U	01-98-0-L	PASSAGEWAY	62.4	0	0		
NPI	S4U		(none)	(weather bulkhead)	118.4	0	0		
NPI	S4U		(none)	(weather bulkhead)	9.6	0	0		
S4U			1-82-2-Q	FORWARD REPAIR #2	8.4	0	0		
S4U			1-82-4-Q	ENGINEERS WORKSHOP	110.9	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	80.7	0	0		
S4U			(none)	(weather overhead)	57.3	0	0		
			01-85-0-L	WARDROOM STATEROOM	(CUI	= L2)			
NPI		S4U	01-68-0-L	PASSAGEWAY	70.4	0	0	DJ	NC
NPI		S4U	01-68-0-L	PASSAGEWAY	70.4	0	0		
NPI		NPI	01-84-2-L	WARDROOM STATEROOM	24	0	0		
NPI		S4U	01-89-2-L	SANITARY SPACE	56	0	0	DJ	NC
NPI		S4U	01-94-2-L	DECONTAMINATION SHOW	25.6	0	0		
NPI		S4U	01-98-0-L	PASSAGEWAY	48	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
NPI		S4U	01-98-0-L	PASSAGEWAY	35.2	0	0		
NPI		S4U	01-98-0-L	PASSAGEWAY	22.4	0	0		
S4U			1-82-1-L	PASSAGEWAY	37	0	0		
S4U			1-82-2-Q	FORWARD REPAIR #2	31.2	0	0		
S4U			1-82-4-Q	ENGINEERS WORKSHOP	19.2	0	0		
S4U			1-90-2-Q	ELCTRICIANS WORKSHOP	28.8	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	110.4	0	0		
S4U			02-96-0-M	SMALL ARMS LOCKER	5.8	0	0		
			01-89-2-L	SANITARY SPACE	(CUI	= LW)			
S4U		NPI	01-84-2-L	WARDROOM STATEROOM	27.2	0	0		
S4U		NPI	01-84-2-L	WARDROOM STATEROOM	56	0	0	DJ	NC
S4U		NPI	01-85-0-L	WARDROOM STATEROOM	56	0	0	DJ	NC
S4U		S4U	01-94-2-L	DECONTAMINATION SHOW	27.2	0	0	DJ	NC
S4U			1-82-2-Q	FORWARD REPAIR #2	6.2	0	0		
S4U			1-82-4-Q	ENGINEERS WORKSHOP	4.2	0	0		
S4U			1-90-2-Q	ELCTRICIANS WORKSHOP	13.4	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	23.8	0	0		
			01-94-1-Q	WINCH MACH. SPACE	(CUI	= QA)			
S4U		NPI	01-82-1-L	PASSENGER STATEROOM	65.6	0	0		
S4U		S4U	01-98-0-L	PASSAGEWAY	68.8	0	0		
S4U		S4U	01-103-1-Q	MACHINERY VENT PLENU	28.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	68.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	43.2	0	0	DWT	X
S4U	S4U		(none)	(weather bulkhead)	6.4	0	0		
S4U			1-82-3-Q	SHIP AND SUPPLY OFFI	40	0	0		
S4U			1-95-1-L	STAIRWAY	4	0	0	HS	X
S4U			1-96-1-L	PASSAGEWAY	26.2	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	42.1	0	0		
S4U			(none)	(weather overhead)	35.3	0	0		
			01-94-2-L	DECONTAMINATION SHOWER	(CUI	= LW)			
S4U		NPI	01-84-2-L	WARDROOM STATEROOM	25.6	0	0		
S4U		NPI	01-85-0-L	WARDROOM STATEROOM	25.6	0	0		
S4U		S4U	01-89-2-L	SANITARY SPACE	27.2	0	0	DJ	NC
S4U		S4U	01-98-0-L	PASSAGEWAY	27.2	0	0	DJ	NC
S4U			1-82-4-Q	ENGINEERS WORKSHOP	10.9	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	10.9	0	0		
			01-98-0-L	PASSAGEWAY	(CUI	= LP)			
S4U		S4U	01-68-0-L	PASSAGEWAY	30.4	0	0	DJ	NC
S4U		NPI	01-82-1-L	PASSENGER STATEROOM	8	0	0		
S4U		NPI	01-82-1-L	PASSENGER STATEROOM	25.6	0	0		
S4U		NPI	01-84-2-L	WARDROOM STATEROOM	62.4	0	0		
S4U		NPI	01-85-0-L	WARDROOM STATEROOM	48	0	0		
S4U		NPI	01-85-0-L	WARDROOM STATEROOM	35.2	0	0		
S4U		NPI	01-85-0-L	WARDROOM STATEROOM	22.4	0	0		
S4U		S4U	01-94-1-Q	WINCH MACH. SPACE	68.8	0	0		
S4U		S4U	01-94-2-L	DECONTAMINATION SHOW	27.2	0	0	DJ	NC
S4U			(none)	(weather bulkhead)	41.6	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U		S4U	01-103-0-Q	AVIONICS SHOP	32	0	0		
S4U		S4U	01-103-0-Q	AVIONICS SHOP	32	0	0	DJ	NC
S4U		S4U	01-103-1-Q	MACHINERY VENT PLENU	46.4	0	0	DJ	NC
S4U		S4U	01-103-2-Q	MACHINERY VENT PLENU	73.6	0	0	DJ	NC
S4U	S4U		(none)	(weather bulkhead)	41.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	32	0	0	DWT	X
S4U			1-82-1-L	PASSAGEWAY	31.8	0	0		
S4U			1-82-4-Q	ENGINEERS WORKSHOP	89.4	0	0		
000		000	1-95-1-L	STAIRWAY	17	0	0		
S4U			1-95-1-Q	LIFE JACKET LOCKER	14.4	0	0		
S4U			1-96-1-L	PASSAGEWAY	18.6	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	68.4	0	0		
S4U			02-63-0-Q	SENSOR ROOM AND COMM	73.4	0	0	HS	X
S4U			02-96-0-M	SMALL ARMS LOCKER	8.3	0	0		
S4U			02-96-0-M	SMALL ARMS LOCKER	8.3	0	0		
S4U			(none)	(weather overhead)	12.8	0	0		
			01-103-0-Q	AVIONICS SHOP	(CUI	= QS)			
S4U		S4U	01-98-0-L	PASSAGEWAY	32	0	0		
S4U		S4U	01-98-0-L	PASSAGEWAY	32	0	0	DJ	NC
S4U		S4U	01-103-1-Q	MACHINERY VENT PLENU	46.4	0	0		
S4U		S4U	01-103-2-Q	MACHINERY VENT PLENU	48	0	0		
S4U		S4U	01-109-2	UPTAKE	62.4	0	0		
S4U		S4U	01-110-1	UPTAKE	64	0	0		
S4U		S4U	01-117-0-Q	HELICOPTOR HANGER	64	0	0	DWT	X
S4U			1-103-1-L	PASSAGEWAY	55.2	0	0		
S4U			1-103-2-L	VESTIBULE	35.2	0	0	HS	X
S4U			1-113-2-L	PASSAGEWAY	20	0	0		
S4U			02-106-0-Q	ELEC EQPT SPACE AND	89.6	0	0		
S4U			(none)	(weather overhead)	20.8	0	0		
			01-103-1-Q	MACHINERY VENT PLENUM COMPT	(CUI	= TH)			
S4U		S4U	01-94-1-Q	WINCH MACH. SPACE	28.8	0	0		
S4U		S4U	01-98-0-L	PASSAGEWAY	46.4	0	0	DJ	NC
S4U		S4U	01-103-0-Q	AVIONICS SHOP	46.4	0	0		
S4U		S4U	01-110-1	UPTAKE	75.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	46.4	0	0		
S4U			1-110-1	UPTAKE	54.5	0	0		
S4U			02-106-0-Q	ELEC EQPT SPACE AND	11.5	0	0		
S4U			(none)	(weather overhead)	43	0	0		
			01-103-2-Q	MACHINERY VENT PLENUM COMPT	(CUI	= TH)			
S4U		S4U	01-98-0-L	PASSAGEWAY	73.6	0	0	DJ	NC
S4U		S4U	01-103-0-Q	AVIONICS SHOP	48	0	0		
S4U		S4U	01-109-2	UPTAKE	73.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	48	0	0		
S4U			1-109-2	UPTAKE	55.2	0	0		
S4U			02-106-0-Q	ELEC EQPT SPACE AND	11.6	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U			(none)	(weather overhead)	43.6	0	0		
			01-109-2	UPTAKE	(CUI	= TU)			
S4U		S4U	01-103-0-Q	AVIONICS SHOP	62.4	0	0		
S4U		S4U	01-103-2-Q	MACHINERY VENT PLENU	73.6	0	0		
S4U		S4U	01-117-0-Q	HELICOPTOR HANGER	73.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	62.4	0	0		
S4U			1-109-2	UPTAKE	71.8	0	0		
S4U			02-106-0-Q	ELEC EQPT SPACE AND	26.5	0	0		
S4U			02-106-2-Q	STACK	33.6	0	0		
S4U			(none)	(weather overhead)	11.6	0	0		
			01-110-1	UPTAKE	(CUI	= TU)			
S4U		S4U	01-103-0-Q	AVIONICS SHOP	64	0	0		
S4U		S4U	01-103-1-Q	MACHINERY VENT PLENU	75.2	0	0		
S4U		S4U	01-117-0-Q	HELICOPTOR HANGER	46.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	56	0	0		
S4U	S4U		(none)	(weather bulkhead)	16	0	0		
S4U			1-110-1	UPTAKE	64.4	0	0		
S4U			02-106-0-Q	ELEC EQPT SPACE AND	28.8	0	0		
S4U			02-106-1-Q	STACK	35.6	0	0		
			02-65A-4-L	STAIRWAY	(CUI	= LP)			
S4U		S4U	02-45-0-Q	FAN SPACE	7.8	0	0		
S4U		S4U	02-63-2-L	PASSAGEWAY	20.8	0	0		
S4U		S4U	02-65-2-L	STAIRWAY	20.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	20.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	20.8	0	0	DO	O
S4U	S4U		(none)	(weather bulkhead)	20.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	13	0	0		
S4U			01-63A-2-L	STAIRWAY	3.5	0	0		
S4U			01-52-0-L	PASSAGEWAY	4.2	0	0		
S4U			01-58-2-L	EO STATEROOM	2.6	0	0		
S4U			(none)	(weather overhead)	6.8	0	0		
			02-45-0-Q	FAN SPACE	(CUI	= QF)			
S4U		S4U	02-65A-4-L	STAIRWAY	7.8	0	0		
S4U		S4U	02-55-1	VENT SHAFT	10.8	0	0		
S4U		S4U	02-55-1	VENT SHAFT	17.4	0	0		
S4U		S4U	02-55-1	VENT SHAFT	10.8	0	0		
S4U		S4U	02-55-1	VENT SHAFT	17.4	0	0		
S4U		S4I	02-63-0-Q	SENSOR ROOM AND COMM	52.8	0	0		
S4U		S4U	02-63-2-L	PASSAGEWAY	30	0	0	DJ	NC
S4U		S4U	02-65-2-L	STAIRWAY	7.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	51.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	82.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	51.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	7.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	7.8	0	0		
S4U			01-47-1-L	VESTIBULE	15.4	0	0		
S4U			01-47-2-L	XO STATEROOM	100	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U			01-47-3-L	SANITARY SPACE	32.6	0	0		
S4U			01-47-4-L	SANITARY SPACE	30	0	0		
S4U			01-47-5-L	CO STATEROOM	85.8	0	0		
S4U			01-52-0-L	PASSAGEWAY	62.7	0	0		
S4U			01-58-2-L	EO STATEROOM	25.9	0	0		
S4U			01-61-1	VOID	5.8	0	0		
S4U			01-61-1-Q	CO OFFICE	4.4	0	0		
S4U			02-48-0-C	PILOTHOUSE	291.4	0	0		
S4U			(none)	(weather overhead)	162.5	0	0		
			02-55-1	VENT SHAFT	(CUI	= TH)			
S4U		S4U	02-45-0-Q	FAN SPACE	10.8	0	0		
S4U		S4U	02-45-0-Q	FAN SPACE	17.4	0	0		
S4U		S4U	02-45-0-Q	FAN SPACE	10.8	0	0		
S4U		S4U	02-45-0-Q	FAN SPACE	17.4	0	0		
S4U			01-55-1	VENT SHAFT	20.9	0	0		
S4U			02-48-0-C	PILOTHOUSE	20.9	0	0		
			02-63-0-Q	SENSOR ROOM AND COMMAND SUPPORT CENTER	(CUI	= C)			
S4I		S4U	02-45-0-Q	FAN SPACE	52.8	0	0		
S4I		S4U	02-63-2-L	PASSAGEWAY	35.2	0	0	DWT	X
S4I		S4U	02-63-2-L	PASSAGEWAY	102.4	0	0		
S4I		S4U	02-65-2-L	STAIRWAY	35.2	0	0		
S4I		S4U	02-72-2-L	SANITARY SPACE	25.6	0	0		
S4I		S4U	02-72-2-L	SANITARY SPACE	48	0	0		
S4I		S4U	02-96-0-M	SMALL ARMS LOCKER	56	0	0		
S4I		S4U	02-96-0-M	SMALL ARMS LOCKER	25.6	0	0		
S4I		S4U	02-96-0-M	SMALL ARMS LOCKER	56	0	0		
S4I	S4U		(none)	(weather bulkhead)	225.7	0	0		
S4I	S4U		(none)	(weather bulkhead)	328.1	0	0		
S4I	S4U		(none)	(weather bulkhead)	105.6	0	0		
S4I	S4U		(none)	(weather bulkhead)	105.6	0	0		
S4I	S4U		(none)	(weather bulkhead)	35.2	0	0		
S4I	S4U		(none)	(weather bulkhead)	25.6	0	0		
S4I	S4U		(none)	(weather bulkhead)	88	0	0		
S4U			01-52-0-L	PASSAGEWAY	48.5	0	0	HS	X
S4U			01-61-1-Q	CO OFFICE	41.8	0	0		
S4U			01-63-1	AC & WW TRUNK	7.2	0	0		
S4U			01-68-0-L	PASSAGEWAY	147.7	0	0	HS	X
S4U			01-68-0-L	PASSAGEWAY	105.8	0	0		
S4U			01-68-2-L	SANITARY SPACE	12.2	0	0		
S4U			01-68-3-L	WARDROOM STATEROOM	89.6	0	0		
S4U			01-68-4-L	WARDROOM STATEROOM	44.8	0	0		
S4U			01-81-1-L	SANITARY SPACE	12.6	0	0		
S4U			01-82-1-L	PASSENGER STATEROOM	100	0	0		
S4U			01-84-2-L	WARDROOM STATEROOM	80.7	0	0		
S4U			01-85-0-L	WARDROOM STATEROOM	110.4	0	0		
S4U			01-89-2-L	SANITARY SPACE	23.8	0	0		
S4U			01-94-1-Q	WINCH MACH. SPACE	42.1	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
S4U			01-94-2-L	DECONTAMINATION SHOW	10.9	0	0		
S4U			01-98-0-L	PASSAGEWAY	68.4	0	0		
S4U			01-98-0-L	PASSAGEWAY	73.4	0	0	HS	X
S4U			(none)	(weather overhead)	1000	0	0		
			02-63-2-L	PASSAGEWAY	(CUI	= LP)			
S4U		S4U	02-65A-4-L	STAIRWAY	20.8	0	0		
S4U		S4U	02-45-0-Q	FAN SPACE	30	0	0	DJ	NC
S4U		S4I	02-63-0-Q	SENSOR ROOM AND COMM	35.2	0	0	DWT	X
S4U		S4I	02-63-0-Q	SENSOR ROOM AND COMM	102.4	0	0		
S4U		S4U	02-65-2-L	STAIRWAY	20.8	0	0		
S4U		S4U	02-65-2-L	STAIRWAY	35.2	0	0		
S4U		S4U	02-72-2-L	SANITARY SPACE	25.6	0	0		
S4U		S4U	02-72-2-L	SANITARY SPACE	48	0	0	DJ	NC
S4U	S4U		(none)	(weather bulkhead)	76.9	0	0	DWT	X
S4U	S4U		(none)	(weather bulkhead)	35.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	20.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	20.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	50	0	0		
S4U			01-63A-2-L	STAIRWAY	20.8	0	0		
S4U			01-52-0-L	PASSAGEWAY	23.5	0	0		
S4U			01-58-2-L	EO STATEROOM	33.1	0	0		
S4U			01-68-0-L	PASSAGEWAY	17.3	0	0		
S4U			01-68-2-L	SANITARY SPACE	20	0	0		
S4U			01-68-4-L	WARDROOM STATEROOM	18.1	0	0		
S4U			(none)	(weather overhead)	112	0	0		
			02-65-2-L	STAIRWAY	(CUI	= LP)			
S4U		S4U	02-65A-4-L	STAIRWAY	20.8	0	0		
S4U		S4U	02-45-0-Q	FAN SPACE	7.8	0	0		
S4U		S4I	02-63-0-Q	SENSOR ROOM AND COMM	35.2	0	0		
S4U		S4U	02-63-2-L	PASSAGEWAY	20.8	0	0		
S4U		S4U	02-63-2-L	PASSAGEWAY	35.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	20.8	0	0	DJ	NC
S4U	S4U		(none)	(weather bulkhead)	35.2	0	0		
S4U	S4U		(none)	(weather bulkhead)	40.9	0	0		
S4U	S4U		(none)	(weather bulkhead)	20.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	13	0	0		
S4U			01-63A-2-L	STAIRWAY	9.6	0	0		
S4U			01-52-0-L	PASSAGEWAY	11.4	0	0		
S4U			(none)	(weather overhead)	11.4	0	0		
			02-72-2-L	SANITARY SPACE	(CUI	= LW)			
S4U		S4I	02-63-0-Q	SENSOR ROOM AND COMM	25.6	0	0		
S4U		S4I	02-63-0-Q	SENSOR ROOM AND COMM	48	0	0		
S4U		S4U	02-63-2-L	PASSAGEWAY	25.6	0	0		
S4U		S4U	02-63-2-L	PASSAGEWAY	48	0	0	DJ	NC
S4U			01-68-2-L	SANITARY SPACE	4.5	0	0		
S4U			01-68-4-L	WARDROOM STATEROOM	14.7	0	0		
S4U			(none)	(weather overhead)	19.2	0	0		

Barrier Materials				Compartment Name	Area	Therm	Durab	Door/	Read
<1>	<2>	<3>			ft2	adj	adj	Hatch	
			02-106-0-Q	ELEC EQPT SPACE AND STRM	(CUI	= AS)			
S4U		S4U	01-117-0-Q	HELICOPTOR HANGER	183	0	0	DWT	X
S4U		S4U	02-106-1-Q	STACK	97.6	0	0		
S4U		S4U	02-106-2-Q	STACK	70.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	183	0	0	DWT	X
S4U	S4U		(none)	(weather bulkhead)	39	0	0		
S4U	S4U		(none)	(weather bulkhead)	24.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	41.5	0	0		
S4U			01-103-0-Q	AVIONICS SHOP	89.6	0	0		
S4U			01-103-1-Q	MACHINERY VENT PLENU	11.5	0	0		
S4U			01-103-2-Q	MACHINERY VENT PLENU	11.6	0	0		
S4U			01-109-2	UPTAKE	26.5	0	0		
S4U			01-110-1	UPTAKE	28.8	0	0		
S4U			(none)	(weather overhead)	168	0	0		
			02-106-1-Q	STACK	(CUI	= TU)			
S4U		S4U	01-117-0-Q	HELICOPTOR HANGER	26.8	0	0		
S4U		S4U	02-106-0-Q	ELEC EQPT SPACE AND	97.6	0	0		
S4U	S4U		(none)	(weather bulkhead)	139.9	0	0		
S4U	S4U		(none)	(weather bulkhead)	40	0	0		
S4U	S4U		(none)	(weather bulkhead)	116	0	0		
S4U	S4U		(none)	(weather bulkhead)	62.4	0	0		
S4U	S4U		(none)	(weather bulkhead)	17.2	0	0		
S4U			01-110-1	UPTAKE	35.6	0	0		
S4U			(none)	(weather overhead)	35.6	0	0		
			02-106-2-Q	STACK	(CUI	= TU)			
S4U		S4U	02-106-0-Q	ELEC EQPT SPACE AND	70.8	0	0		
S4U	S4U		(none)	(weather bulkhead)	116	0	0		
S4U	S4U		(none)	(weather bulkhead)	116	0	0		
S4U	S4U		(none)	(weather bulkhead)	116	0	0		
S4U	S4U		(none)	(weather bulkhead)	45.2	0	0		
S4U			01-109-2	UPTAKE	33.6	0	0		
S4U			(none)	(weather overhead)	33.6	0	0		
			02-48-0-C	PILOTHOUSE	(CUI	= C)			
S4I	S4U		(none)	(weather bulkhead)	144	0	0	DJ	NC
S4I	S4U		(none)	(weather bulkhead)	88.7	0	0		
S4I	S4U		(none)	(weather bulkhead)	41	0	0	DWT	X
S4I	S4U		(none)	(weather bulkhead)	19.2	0	0		
S4I	S4U		(none)	(weather bulkhead)	144	0	0	DO	O
S4I	S4U		(none)	(weather bulkhead)	19.2	0	0		
S4I	S4U		(none)	(weather bulkhead)	41	0	0	DWT	X
S4I	S4U		(none)	(weather bulkhead)	88.7	0	0		
S4U			02-45-0-Q	FAN SPACE	291.4	0	0		
S4U			02-55-1	VENT SHAFT	20.9	0	0		
S4U			3-47-0-C	COMMUNICATIONS CENTE	280.7	0	0		
S4U			(none)	(weather overhead)	31.5	0	0		

Table B.2.1 SAFE Provided Barrier materials (attachment)

ID	Descripton	Structural or Non	Thickness inches	Density lb/ft^3	Spec Ht BTU/lb.F°	Therm.Cond BTU/min.ft.F°	Ht Rel %	Tbar X-1	Tbar X-2	Tbar X-3	Dbar X-1	Dbar X-2	Dbar X-3
								kBTU/min.ft^2			kBTU/min.ft^2		
000	Zero-strength (includes screening and grating)	N	0.000	0	0.000	96.29	100	0	0	0	0	0	0
A2I	1/4" Aluminum with thermal insulation	S	2.000	162	0.048	0.05	5	3	6	10	3	6	10
A2U	1/4" Aluminum	S	0.250	166	0.230	1.22	15	0	2	4	4	6	10
C5U	5/8" Celotex (overhead: below crawl space layer)	N	0.625	1	0.167	0.00	25	1	3	4	1	3	4
F2U	1/4" Fiberglass Toilet/Shower Enclosure	N	0.250	86	0.229	0.00	35	2	5	7	25	35	40
NPI	Nomex honeycomb core - plastic laminate & insulation	N	2.000	3	0.289	0.00	30	2	8	10	9	18	22
NPU	Nomex honeycomb core - plastic laminate facing	N	0.625	3	0.289	0.00	30	2	6	14	3	12	20
NSU	Nomex honeycomb core - stainless steel facing	N	0.625	3	0.289	0.00	25	8	20	30	55	80	105
P7P	7/8" Plywood - plastic laminate facing, both sides	N	0.875	34	0.290	0.00	15	6	12	21	10	20	27
S2I	1/4" Steel with thermal insulation	S	2.000	487	0.024	0.01	5	5	15	18	75	100	120
S2U	1/4" Steel	S	0.250	490	0.119	0.44	5	1	4	10	60	80	100
S3I	3/8" Steel with thermal insulation	S	2.000	487	0.024	0.01	5	6	18	20	80	110	130
S3U	3/8" Steel	S	0.375	490	0.119	0.44	5	1	4	10	65	85	105
S4I	1/2" Steel with thermal insulation	S	2.000	487	0.024	0.01	5	6	18	20	80	110	130
S4U	1/2" Steel	S	0.500	490	0.119	0.44	5	2	5	12	70	90	110
S5U	5/8" Steel	S	0.625	490	0.119	0.44	5	2	5	12	75	95	115

Table B.3 Fire Safety Objectives

Plan ID	Compartment Name	MAL	FAL	FREQ.
		Rating	Years	EB
CUI=AG	(Gear Locker)			
1-56-1-Q	LOCKER	4	8	0.0010
1-62-2-Q	SEABAG LKR	4	8	0.0010
1-65-2-Q	FOUL WEATHER AND LIFE VEST LKR	4	8	0.0010
1-95-1-Q	LIFE JACKET LOCKER	2	21	0.0010
1-117-3-Q	RECREATION LKR	4	8	0.0010
1-201-1-Q	LIFE JACKET LCKR	2	21	0.0010
1-205-1-Q	FOUL WEATHER LIFE VEST LKR	4	8	0.0010
2-80-1-Q	CG LKR	4	8	0.0010
2-165-1-Q	SEABAG LKR	4	8	0.0010
2-186-2-Q	SEA BAG LKR	4	8	0.0010
CUI=AR	(Refrigerated Storage)			
3-175-0-A	REFRIGERATED STORES	2	21	0.0009
CUI=AS	(Storeroom)			
1-53-1-Q	MOVIE LKR	4	8	0.0009
1-58-1-L	CREWS LOCKER SPACE	3	18	0.0009
1-103-3-A	ELECTRONIC STORES	2	23	0.0009
1-103-4-A	ENGINEERS TOOL RM	2	23	0.0009
1-121-2-Q	SHIP STORES	3	12	0.0009
1-169-1-L	MEDICAL STORES	2	25	0.0009
1-186-0-A	ENGINEERS STORES	2	25	0.0009
02-106-0-Q	ELEC EQPT SPACE AND STRM	2	24	0.0009
3-26A-0-A	STORES	3	15	0.0009
3-169-2-A	STOREROOM	2	25	0.0009
2-26A-0-A	STOREROOMS	3	15	0.0009
2-17-0-A	BOSUN STORES	2	23	0.0009
2-59-4-L	CREWS LOCKER SPACE	3	18	0.0009
2-64-1-L	CREWS LOCKER SPACE	3	18	0.0009
2-175-0-L	CREW LOCKER SPACE	3	18	0.0009
2-194-0-L	CREW LOCKER SPACE	3	18	0.0009
2-207A-0-A	STORAGE AREA	3	15	0.0009
CUI=C	(Ship Control/Communications)			
1-26-1-C	GUN CONTROL BOOTH	2	22	0.0012
02-63-0-Q	SENSOR ROOM AND COMMAND SUPPORT CENTER	2	26	0.0012
02-48-0-C	PILOTHOUSE	2	26	0.0012
3-47-0-C	COMMUNICATIONS CENTER	2	26	0.0012
2-47-1-C	IC ROOM	2	26	0.0012
3-152-0-E	ENGINEERING CONTROL CENTER	2	26	0.0012
CUI=EM	(Main Propulsion - Mechanical)			
3-103-0-E	ENGINE ROOM	2	26	0.0272
3-152A-0-E	ENGINE ROOM EXT	2	26	0.0272
CUI=K	(Hazardous Material Storage)			
1-5-0-K	FLAMMABLE LIQ. STOREROOM	1	30	0.0013
CUI=L1	(Senior Officer's Cabin)			
01-47-2-L	XO STATEROOM	3	14	0.0008
01-47-5-L	CO STATEROOM	3	14	0.0008

Plan ID	Compartment Name	MAL	FAL	FREQ.
		Rating	Years	EB
01-58-2-L	EO STATEROOM	3	14	0.0008
01-68-3-L	WARDROOM STATEROOM	3	14	0.0008
01-82-1-L	PASSENGER STATEROOM	3	14	0.0008
CUI=L2	(Officer/CPO Quarters)			
1-165-2-L	CPO STATEROOM	3	14	0.0008
1-165-4-L	CPO STATEROOM	3	14	0.0008
1-177-0-L	CPO STATEROOM	3	14	0.0008
1-199-0-L	CPO STATEROOM	3	14	0.0008
1-199-2-L	CPO STATEROOM	3	14	0.0008
01-68-4-L	WARDROOM STATEROOM	3	14	0.0008
01-84-2-L	WARDROOM STATEROOM	3	14	0.0008
01-85-0-L	WARDROOM STATEROOM	3	14	0.0008
CUI=L5	(Crews Berthing)			
1-61-2-L	CREWS BERTHING	3	14	0.0008
2-47-0-L	CREWS BERTHING	3	14	0.0008
2-66-1-L	CREWS BERTHING	3	14	0.0008
2-165-3-L	CREW BERTHING AREA	3	14	0.0008
2-186-4-L	CREW BERTHING	3	14	0.0008
CUI=LL	(Wardroom/Mess/Lounge Areas)			
1-117-0-L	CREW MESS	2	24	0.0008
1-117-2-L	WARDROOM	2	24	0.0008
1-165-3-L	CPO LOUNGE	2	24	0.0008
2-72-2-L	CREWS LOUNGE	2	20	0.0008
2-165-2-L	CREWS LOUNGE	2	20	0.0008
2-186-1-L	CREW LOUNGE	2	20	0.0008
CUI=LM	(Medical/Dental Spaces)			
1-179-1-L	DISPENSARY	2	25	0.0002
CUI=LP	(Passageway/Staircase/Vestibule)			
1-26-2-L	PASSAGEWAY	3	17	0.0001
1-47-0-L	PASSAGEWAY	3	17	0.0001
1-62-2-L	STAIRWAY	3	17	0.0001
1-63-0-L	PASASGEWAY	3	17	0.0001
1-82-1-L	PASSAGEWAY	3	17	0.0001
1-95-1-L	STAIRWAY	3	17	0.0001
1-96-1-L	PASSAGEWAY	3	17	0.0001
1-103-1-L	PASSAGEWAY	3	17	0.0001
1-103-2-L	VESTIBULE	3	17	0.0001
1-113-2-L	PASSAGEWAY	3	17	0.0001
1-165-0-L	PASSAGEWAY	3	17	0.0001
1-186-0-L	PASSAGEWAY	3	17	0.0001
1-207-1-L	VESTIBULE	3	17	0.0001
01-63A-2-L	STAIRWAY	3	17	0.0001
01-47-1-L	VESTIBULE	3	17	0.0001
01-52-0-L	PASSAGEWAY	3	17	0.0001
01-68-0-L	PASSAGEWAY	3	17	0.0001
01-98-0-L	PASSAGEWAY	3	17	0.0001
02-65A-4-L	STAIRWAY	3	17	0.0001
02-63-2-L	PASSAGEWAY	3	17	0.0001

Plan ID	Compartment Name	MAL	FAL	FREQ.
		Rating	Years	EB
02-65-2-L	STAIRWAY	3	17	0.0001
3-62-2-L	STAIRWAY	3	17	0.0001
3-94-1-L	STAIRWAY	3	17	0.0001
2-56-0-L	PASSAGEWAY	3	17	0.0001
2-64-2-L	STAIRWAY	3	17	0.0001
2-95-1-L	STAIRWAY	3	17	0.0001
2-178-1-L	STAIRWAY	3	17	0.0001
2-199-1-L	STAIRWAY	3	17	0.0001
2-210-1-L	STAIRWAY	3	17	0.0001
CUI=LW	(Sanitary Spaces)			
1-51-2-L	SANITARY SPACE	4	8	0.0002
1-174-2-L	SANITARY SPACE	4	8	0.0002
1-186-4-L	SANITARY SPACE	4	8	0.0002
01-47-3-L	SANITARY SPACE	4	8	0.0002
01-47-4-L	SANITARY SPACE	4	8	0.0002
01-68-2-L	SANITARY SPACE	4	8	0.0002
01-81-1-L	SANITARY SPACE	4	8	0.0002
01-89-2-L	SANITARY SPACE	4	8	0.0002
01-94-2-L	DECONTAMINATION SHOWER	4	8	0.0002
02-72-2-L	SANITARY SPACE	4	8	0.0002
2-58-1-L	SANITARY SPACE	4	8	0.0002
2-59-2-L	SANITARY SPACE	4	8	0.0002
2-75-0-L	SANITARY SPACE	4	8	0.0002
3-160-2-L	SANITARY SPACE	4	8	0.0002
2-165-0-L	SANITARY SPACE	4	8	0.0002
2-186-0-L	SANITARY SPACE	4	8	0.0002
CUI=QA	(Aux Machinery Spaces)			
1-186-2-Q	COMPUTER ROOM	2	26	0.0029
1-207-3-J	JP-5 FUELING	3	19	0.0029
01-94-1-Q	WINCH MACH. SPACE	3	19	0.0029
3-82-0-E	AUXILIARY MACHINE SPACE NO. 2	2	26	0.0029
4-186-0-J	JP-5 PUMP ROOM	2	26	0.0029
2-82-0-E	AMS NO 1	2	26	0.0029
3-228-0-E	STEERING GEAR ROOM	2	26	0.0029
CUI=QF	(Fan Room)			
1-43-2-Q	FAN ROOM	3	18	0.0004
1-117-1-Q	FAN ROOM	3	18	0.0004
1-207-2-Q	FAN ROOM	3	18	0.0004
02-45-0-Q	FAN SPACE	3	18	0.0004
2-207-1-Q	FAN ROOM	3	18	0.0004
CUI=QG	(Galley/Pantry/Scullery)			
1-129-2-Q	SCULLERY	2	20	0.0026
1-141-2-Q	GALLEY	2	26	0.0026
1-186-3-Q	TRASH COMPACTOR SPACE	3	19	0.0026
CUI=QL	(Laundry)			
1-47-1-Q	LAUNDRY	3	19	0.0031
CUI=QO	(Office Spaces)			
1-73-1-Q	ENGINEERS OFFICE	3	19	0.0004

Plan ID	Compartment Name	MAL	FAL	FREQ.
		Rating	Years	EB
1-82-3-Q	SHIP AND SUPPLY OFFICE	3	19	0.0004
01-61-1-Q	CO OFFICE	3	19	0.0004
CUI=QS	(Shops)			
1-12-0-Q	ANCHOR WINDLASS RM AND BOSUN'S WORKSHOP	3	19	0.0018
1-82-2-Q	FORWARD REPAIR #2	2	26	0.0018
1-82-4-Q	ENGINEERS WORKSHOP	2	22	0.0018
1-90-2-Q	ELCTRICIANS WORKSHOP	2	22	0.0018
01-103-0-Q	AVIONICS SHOP	3	19	0.0018
2-40-1-Q	ORDNANCE WORKSHOP	2	22	0.0018
3-152-2-E	ENGINEERS WORK SPACE	2	22	0.0018
2-221-1-Q	AFT REPAIR #3	2	26	0.0018
CUI=TH	(Trunks/Hoists/Dumbwaiters)			
1-55-1	VENT SHAFT	4	8	0.0001
1-63-1	AC&WW TRUNK	4	8	0.0001
3-165-1-Q	SERVICE ELEVATOR TRUNK	4	8	0.0001
01-55-1	VENT SHAFT	4	8	0.0001
01-63-1	AC & WW TRUNK	4	8	0.0001
01-103-1-Q	MACHINERY VENT PLENUM COMPT	4	8	0.0001
01-103-2-Q	MACHINERY VENT PLENUM COMPT	4	8	0.0001
02-55-1	VENT SHAFT	4	8	0.0001
2-58-1	WW & AC TRUNK	4	8	0.0001
CUI=TU	(Stacks/Engine Uptakes)			
1-109-2	UPTAKE	2	23	0.0013
1-110-1	UPTAKE	2	23	0.0013
01-109-2	UPTAKE	2	23	0.0013
01-110-1	UPTAKE	2	23	0.0013
02-106-1-Q	STACK	2	23	0.0013
02-106-2-Q	STACK	2	23	0.0013
CUI=V	(Voids/Cofferdams)			
1-61-1	VOID	4	8	0.0001
01-61-1	VOID	4	8	0.0001
CUI=W	(Water Tank (empty))			
3-77-0-W	WATER	4	8	0.0004

Table B.4 Fire Detection

Plan ID	Compartment Name	Detection System		% Time Monitored		Est. Min. to Detect.	
		Zone	Quantity/Type	at Sea	in Port	at Sea	in Port
CUI=AG	(Gear Locker)						
1-56-1-Q	LOCKER	1	1 SMO	85	85	1	1
1-62-2-Q	SEABAG LKR			50	50	6	6
1-65-2-Q	FOUL WEATHER AND LIFE VEST LKR			50	50	6	6
1-95-1-Q	LIFE JACKET LOCKER			50	50	6	6
1-117-3-Q	RECREATION LKR			60	50	4	6
1-201-1-Q	LIFE JACKET LCKR			50	50	6	6
1-205-1-Q	FOUL WEATHER LIFE VEST LKR			50	50	6	6
2-80-1-Q	CG LKR			50	50	6	6
2-165-1-Q	SEABAG LKR			50	50	6	6
2-186-2-Q	SEA BAG LKR			50	50	6	6
CUI=AR	(Refrigerated Storage)						
3-175-0-A	REFRIGERATED STORES			50	50	6	6
CUI=AS	(Storeroom)						
1-53-1-Q	MOVIE LKR			70	70	2	2
1-58-1-L	CREWS LOCKER SPACE	1	1 SMO	85	85	1	1
1-103-3-A	ELECTRONIC STORES			60	60	4	4
1-103-4-A	ENGINEERS TOOL RM			60	60	4	4
1-121-2-Q	SHIP STORES			60	60	4	4
1-169-1-L	MEDICAL STORES			50	50	6	6
1-186-0-A	ENGINEERS STORES			60	60	4	4
02-106-0-Q	ELEC EQPT SPACE AND STRM	16	1 SMO	95	95	1	1
3-26A-0-A	STORES	11	1 SMO	95	95	1	1
3-169-2-A	STOREROOM	13	1 SMO	95	95	1	1
2-26A-0-A	STOREROOMS	11	1 SMO	95	95	1	1
2-17-0-A	BOSUN STORES	11	1 SMO	95	95	1	1
2-59-4-L	CREWS LOCKER SPACE	1	1 SMO	85	85	1	1
2-64-1-L	CREWS LOCKER SPACE	1	1 SMO	85	85	1	1
2-175-0-L	CREW LOCKER SPACE	2	1 SMO	85	85	1	1
2-194-0-L	CREW LOCKER SPACE	2	1 SMO	85	85	1	1
2-207A-0-A	STORAGE AREA			60	60	4	4
CUI=C	(Ship Control/Communications)						
1-26-1-C	GUN CONTROL BOOTH			65	50	3	6
02-63-0-Q	SENSOR ROOM AND COMMAND SUPPORT CENTER	15	1 SMO	95	95	1	1
02-48-0-C	PILOTHOUSE			100	50	1	6
3-47-0-C	COMMUNICATIONS CENTER	12	1 SMO	95	95	1	1
2-47-1-C	IC ROOM	1	4 TEMP	65	50	3	6
3-152-0-E	ENGINEERING CONTROL CENTER			100	50	1	6
CUI=EM	(Main Propulsion - Mechanical)						
3-103-0-E	ENGINE ROOM	8	1 SMO	95	95	1	1
3-152A-0-E	ENGINE ROOM EXT			95	95	1	1
CUI=K	(Hazardous Material Storage)						
1-5-0-K	FLAMMABLE LIQ. STOREROOM	3	1 TEMP	95	95	1	1
CUI=L1	(Senior Officer's Cabin)						
01-47-2-L	XO STATEROOM	1	1 SMO	95	95	1	1
01-47-5-L	CO STATEROOM	1	1 SMO	85	85	1	1
01-58-2-L	EO STATEROOM	1	1 SMO	85	85	1	1

Plan ID	Compartment Name	Detection System		% Time Monitored		Est. Min. to Detect.	
		Zone	Quantity/Type	at Sea	in Port	at Sea	in Port
01-68-3-L	WARDROOM STATEROOM	1	1 SMO	85	85	1	1
01-82-1-L	PASSENGER STATEROOM	1	1 SMO	85	85	1	1
CUI=L2	(Officer/CPO Quarters)						
1-165-2-L	CPO STATEROOM	2	1 SMO	85	85	1	1
1-165-4-L	CPO STATEROOM	2	1 SMO	85	85	1	1
1-177-0-L	CPO STATEROOM	2	1 SMO	85	85	1	1
1-199-0-L	CPO STATEROOM	2	1 SMO	85	85	1	1
1-199-2-L	CPO STATEROOM	2	1 SMO	85	85	1	1
01-68-4-L	WARDROOM STATEROOM	1	1 SMO	85	85	1	1
01-84-2-L	WARDROOM STATEROOM	1	1 SMO	85	85	1	1
01-85-0-L	WARDROOM STATEROOM	1	1 SMO	85	85	1	1
CUI=L5	(Crews Berthing)						
1-61-2-L	CREWS BERTHING	1	1 SMO	85	85	1	1
2-47-0-L	CREWS BERTHING	1	1 SMO	85	85	1	1
2-66-1-L	CREWS BERTHING	1	1 SMO	85	85	1	1
2-165-3-L	CREW BERTHING AREA	2	1 SMO	85	85	1	1
2-186-4-L	CREW BERTHING	2	1 SMO	85	85	1	1
CUI=LL	(Wardroom/Mess/Lounge Areas)						
1-117-0-L	CREW MESS			70	70	2	2
1-117-2-L	WARDROOM			60	60	4	4
1-165-3-L	CPO LOUNGE	2	1 SMO	85	85	1	1
2-72-2-L	CREWS LOUNGE	1	1 SMO	85	85	1	1
2-165-2-L	CREWS LOUNGE	2	1 SMO	85	85	1	1
2-186-1-L	CREW LOUNGE	2	1 SMO	85	85	1	1
CUI=LM	(Medical/Dental Spaces)						
1-179-1-L	DISPENSARY	2	1 SMO	60	60	4	4
CUI=LP	(Passageway/Staircase/Vestibule)						
1-26-2-L	PASSAGEWAY			60	50	4	6
1-47-0-L	PASSAGEWAY	1	1 SMO	85	85	1	1
1-62-2-L	STAIRWAY			85	85	1	1
1-63-0-L	PASASGEWAY			85	85	1	1
1-82-1-L	PASSAGEWAY			95	95	1	1
1-95-1-L	STAIRWAY			95	95	1	1
1-96-1-L	PASSAGEWAY	7	1 SMO	95	95	1	1
1-103-1-L	PASSAGEWAY			95	95	1	1
1-103-2-L	VESTIBULE			95	95	1	1
1-113-2-L	PASSAGEWAY			95	95	1	1
1-165-0-L	PASSAGEWAY	2	1 SMO	85	85	1	1
1-186-0-L	PASSAGEWAY	2	1 SMO	85	85	1	1
1-207-1-L	VESTIBULE			85	85	1	1
01-63A-2-L	STAIRWAY			85	85	1	1
01-47-1-L	VESTIBULE			60	50	4	6
01-52-0-L	PASSAGEWAY	1	1 SMO	85	85	1	1
01-68-0-L	PASSAGEWAY	1	1 SMO	85	85	1	1
01-98-0-L	PASSAGEWAY			60	50	4	6
02-65A-4-L	STAIRWAY			60	50	4	6
02-63-2-L	PASSAGEWAY			60	50	4	6
02-65-2-L	STAIRWAY			60	50	4	6
3-62-2-L	STAIRWAY			95	95	1	1
3-94-1-L	STAIRWAY			70	60	2	4
2-56-0-L	PASSAGEWAY	1	1 SMO	85	85	1	1
2-64-2-L	STAIRWAY			85	85	1	1

Plan ID	Compartment Name	Detection System		% Time Monitored		Est. Min. to Detect.	
		Zone	Quantity/Type	at Sea	in Port	at Sea	in Port
2-95-1-L	STAIRWAY			95	95	1	1
2-178-1-L	STAIRWAY			85	85	1	1
2-199-1-L	STAIRWAY			85	85	1	1
2-210-1-L	STAIRWAY			65	60	3	4
CUI=LW	(Sanitary Spaces)						
1-51-2-L	SANITARY SPACE			70	60	2	4
1-174-2-L	SANITARY SPACE			65	60	3	4
1-186-4-L	SANITARY SPACE			60	50	4	6
01-47-3-L	SANITARY SPACE			50	50	6	6
01-47-4-L	SANITARY SPACE			50	50	6	6
01-68-2-L	SANITARY SPACE			60	50	4	6
01-81-1-L	SANITARY SPACE			60	50	4	6
01-89-2-L	SANITARY SPACE			60	50	4	6
01-94-2-L	DECONTAMINATION SHOWER			50	50	6	6
02-72-2-L	SANITARY SPACE			60	50	4	6
2-58-1-L	SANITARY SPACE			70	60	2	4
2-59-2-L	SANITARY SPACE			70	60	2	4
2-75-0-L	SANITARY SPACE			70	60	2	4
3-160-2-L	SANITARY SPACE			60	50	4	6
2-165-0-L	SANITARY SPACE			70	60	2	4
2-186-0-L	SANITARY SPACE			70	60	2	4
CUI=QA	(Aux Machinery Spaces)						
1-186-2-Q	COMPUTER ROOM	2	1 SMO	85	85	1	1
1-207-3-J	JP-5 FUELING			50	50	6	6
01-94-1-Q	WINCH MACH. SPACE			60	50	4	6
3-82-0-E	AUXILIARY MACHINE SPACE NO. 2			70	60	2	4
4-186-0-J	JP-5 PUMP ROOM	14	1 SMO	95	95	1	1
2-82-0-E	AMS NO 1	7	1 SMO	95	95	1	1
3-228-0-E	STEERING GEAR ROOM	10	1 SMO	95	95	1	1
CUI=QF	(Fan Room)						
1-43-2-Q	FAN ROOM			50	50	6	6
1-117-1-Q	FAN ROOM			50	50	6	6
1-207-2-Q	FAN ROOM			50	50	6	6
02-45-0-Q	FAN SPACE			50	50	6	6
2-207-1-Q	FAN ROOM			50	50	6	6
CUI=QG	(Galley/Pantry/Scullery)						
1-129-2-Q	SCULLERY			80	70	1	2
1-141-2-Q	GALLEY			80	80	1	1
1-186-3-Q	TRASH COMPACTOR SPACE	5	1 SMO	95	95	1	1
CUI=QL	(Laundry)						
1-47-1-Q	LAUNDRY			65	65	3	3
CUI=QO	(Office Spaces)						
1-73-1-Q	ENGINEERS OFFICE	1	1 SMO	85	85	1	1
1-82-3-Q	SHIP AND SUPPLY OFFICE			80	65	1	3
01-61-1-Q	CO OFFICE			80	65	1	3
CUI=QS	(Shops)						
1-12-0-Q	ANCHOR WINDLASS RM AND BOSUN'S WORKSHOP			65	50	3	6
1-82-2-Q	FORWARD REPAIR #2			60	50	4	6
1-82-4-Q	ENGINEERS WORKSHOP			65	50	3	6
1-90-2-Q	ELCTRICIANS WORKSHOP			65	50	3	6
01-103-0-Q	AVIONICS SHOP			65	50	3	6

Plan ID	Compartment Name	Detection System		% Time Monitored		Est. Min. to Detect.	
		Zone	Quantity/Type	at Sea	in Port	at Sea	in Port
2-40-1-Q	ORDNANCE WORKSHOP	6	1 SMO	95	95	1	1
3-152-2-E	ENGINEERS WORK SPACE			70	60	2	4
2-221-1-Q	AFT REPAIR #3			60	50	4	6
CUI=TH	(Trunks/Hoists/Dumbwaiters)						
1-55-1	VENT SHAFT			50	50	6	6
1-63-1	AC&WW TRUNK			50	50	6	6
3-165-1-Q	SERVICE ELEVATOR TRUNK			50	50	6	6
01-55-1	VENT SHAFT			50	50	6	6
01-63-1	AC & WW TRUNK			50	50	6	6
01-103-1-Q	MACHINERY VENT PLENUM COMPT			50	50	6	6
01-103-2-Q	MACHINERY VENT PLENUM COMPT			50	50	6	6
02-55-1	VENT SHAFT			50	50	6	6
2-58-1	WW & AC TRUNK			50	50	6	6
CUI=TU	(Stacks/Engine Uptakes)						
1-109-2	UPTAKE			70	70	2	2
1-110-1	UPTAKE			70	70	2	2
01-109-2	UPTAKE			70	70	2	2
01-110-1	UPTAKE			70	70	2	2
02-106-1-Q	STACK			70	70	2	2
02-106-2-Q	STACK			70	70	2	2
CUI=V	(Voids/Cofferdams)						
1-61-1	VOID			50	50	6	6
01-61-1	VOID			50	50	6	6
CUI=W	(Water Tank (empty))						
3-77-0-W	WATER			50	50	6	6

Table B.5 Automated and Manual Fire Protection Systems

Plan ID	Compartment Name	Automated Systems	Manual Firefighting Equipment	
			Portable Extinguishers	Hose/3% AFFF
CUI=AG	(Gear Locker)			
1-56-1-Q	LOCKER			
1-62-2-Q	SEABAG LKR			
1-65-2-Q	FOUL WEATHER AND LIFE VEST LKR			
1-95-1-Q	LIFE JACKET LOCKER			
1-117-3-Q	RECREATION LKR			
1-201-1-Q	LIFE JACKET LCKR			
1-205-1-Q	FOUL WEATHER LIFE VEST LKR			
2-80-1-Q	CG LKR			
2-165-1-Q	SEABAG LKR			
2-186-2-Q	SEA BAG LKR			
CUI=AR	(Refrigerated Storage)			
3-175-0-A	REFRIGERATED STORES			
CUI=AS	(Storeroom)			
1-53-1-Q	MOVIE LKR			
1-58-1-L	CREWS LOCKER SPACE			
1-103-3-A	ELECTRONIC STORES			
1-103-4-A	ENGINEERS TOOL RM			
1-121-2-Q	SHIP STORES			
1-169-1-L	MEDICAL STORES			
1-186-0-A	ENGINEERS STORES			
02-106-0-Q	ELEC EQPT SPACE AND STRM		1 CO2	
3-26A-0-A	STORES		1 PKP	
3-169-2-A	STOREROOM		1 CO2, 1 PKP	
2-26A-0-A	STOREROOMS		2 CO2, 1 PKP	
2-17-0-A	BOSUN STORES		1 PKP	
2-59-4-L	CREWS LOCKER SPACE			
2-64-1-L	CREWS LOCKER SPACE			
2-175-0-L	CREW LOCKER SPACE		1 PKP	1 SW
2-194-0-L	CREW LOCKER SPACE		1 PKP	
2-207A-0-A	STORAGE AREA		1 PKP	1 SW, 1 AFFF
CUI=C	(Ship Control/Communications)			
1-26-1-C	GUN CONTROL BOOTH			
02-63-0-Q	SENSOR ROOM AND COMMAND SUPPORT CENTER		4 CO2	
02-48-0-C	PILOTHOUSE		2 CO2	
3-47-0-C	COMMUNICATIONS CENTER		1 CO2	
2-47-1-C	IC ROOM		1 CO2	
3-152-0-E	ENGINEERING CONTROL CENTER		2 CO2	
CUI=EM	(Main Propulsion - Mechanical)			
3-103-0-E	ENGINE ROOM		2 CO2, 4 PKP	2 SW, 1 PKP
3-152A-0-E	ENGINE ROOM EXT			
CUI=K	(Hazardous Material Storage)			
1-5-0-K	FLAMMABLE LIQ. STOREROOM	CO2	1 PKP	
CUI=L1	(Senior Officer's Cabin)			
01-47-2-L	XO STATEROOM			
01-47-5-L	CO STATEROOM			
01-58-2-L	EO STATEROOM			
01-68-3-L	WARDROOM STATEROOM			

Plan ID	Compartment Name	Automated Systems	Manual Firefighting Equipment	
			Portable Extinguishers	Hose/3% AFFF
01-82-1-L	PASSENGER STATEROOM			
CUI=L2	(Officer/CPO Quarters)			
1-165-2-L	CPO STATEROOM			
1-165-4-L	CPO STATEROOM			
1-177-0-L	CPO STATEROOM			
1-199-0-L	CPO STATEROOM			
1-199-2-L	CPO STATEROOM			
01-68-4-L	WARDROOM STATEROOM			
01-84-2-L	WARDROOM STATEROOM			
01-85-0-L	WARDROOM STATEROOM			
CUI=L5	(Crews Berthing)			
1-61-2-L	CREWS BERTHING			
2-47-0-L	CREWS BERTHING			
2-66-1-L	CREWS BERTHING			
2-165-3-L	CREW BERTHING AREA			
2-186-4-L	CREW BERTHING			
CUI=LL	(Wardroom/Mess/Lounge Areas)			
1-117-0-L	CREW MESS		1 CO2, 2 PKP	1 SW
1-117-2-L	WARDROOM		1 PKP	
1-165-3-L	CPO LOUNGE			
2-72-2-L	CREWS LOUNGE			
2-165-2-L	CREWS LOUNGE			
2-186-1-L	CREW LOUNGE			
CUI=LM	(Medical/Dental Spaces)			
1-179-1-L	DISPENSARY			
CUI=LP	(Passageway/Staircase/Vestibule)			
1-26-2-L	PASSAGEWAY		1 PKP	1 SW
1-47-0-L	PASSAGEWAY		2 PKP	1 SW
1-62-2-L	STAIRWAY			
1-63-0-L	PASASGEWAY			
1-82-1-L	PASSAGEWAY		1 PKP	1 SW, 1 AFFF
1-95-1-L	STAIRWAY			
1-96-1-L	PASSAGEWAY			
1-103-1-L	PASSAGEWAY			1 AFFF
1-103-2-L	VESTIBULE			
1-113-2-L	PASSAGEWAY			
1-165-0-L	PASSAGEWAY		2 PKP	1 SW
1-186-0-L	PASSAGEWAY		2 PKP	1 SW
1-207-1-L	VESTIBULE			1 AFFF
01-63A-2-L	STAIRWAY			
01-47-1-L	VESTIBULE			
01-52-0-L	PASSAGEWAY		1 PKP	1 SW
01-68-0-L	PASSAGEWAY		2 PKP	1 SW
01-98-0-L	PASSAGEWAY			
02-65A-4-L	STAIRWAY			
02-63-2-L	PASSAGEWAY		1 PKP	
02-65-2-L	STAIRWAY			
3-62-2-L	STAIRWAY			
3-94-1-L	STAIRWAY			
2-56-0-L	PASSAGEWAY		1 PKP	1 SW
2-64-2-L	STAIRWAY			
2-95-1-L	STAIRWAY			

Plan ID	Compartment Name	Automated Systems	Manual Firefighting Equipment	
			Portable Extinguishers	Hose/3% AFFF
2-178-1-L	STAIRWAY			
2-199-1-L	STAIRWAY			
2-210-1-L	STAIRWAY			
CUI=LW	(Sanitary Spaces)			
1-51-2-L	SANITARY SPACE			
1-174-2-L	SANITARY SPACE			
1-186-4-L	SANITARY SPACE			
01-47-3-L	SANITARY SPACE			
01-47-4-L	SANITARY SPACE			
01-68-2-L	SANITARY SPACE			
01-81-1-L	SANITARY SPACE			
01-89-2-L	SANITARY SPACE			
01-94-2-L	DECONTAMINATION SHOWER			
02-72-2-L	SANITARY SPACE			
2-58-1-L	SANITARY SPACE			
2-59-2-L	SANITARY SPACE			
2-75-0-L	SANITARY SPACE			
3-160-2-L	SANITARY SPACE			
2-165-0-L	SANITARY SPACE			
2-186-0-L	SANITARY SPACE			
CUI=QA	(Aux Machinery Spaces)			
1-186-2-Q	COMPUTER ROOM		1 CO2	
1-207-3-J	JP-5 FUELING			
01-94-1-Q	WINCH MACH. SPACE			
3-82-0-E	AUXILIARY MACHINE SPACE NO. 2		1 CO2	
4-186-0-J	JP-5 PUMP ROOM	CO2	1 PKP	
2-82-0-E	AMS NO 1		1 CO2, 1 PKP	1 PKP
3-228-0-E	STEERING GEAR ROOM		1 CO2, 1 PKP	
CUI=QF	(Fan Room)			
1-43-2-Q	FAN ROOM			
1-117-1-Q	FAN ROOM			
1-207-2-Q	FAN ROOM			
02-45-0-Q	FAN SPACE			
2-207-1-Q	FAN ROOM			
CUI=QG	(Galley/Pantry/Scullery)			
1-129-2-Q	SCULLERY			
1-141-2-Q	GALLEY	APC	1 CO2, 1 PKP	
1-186-3-Q	TRASH COMPACTOR SPACE			
CUI=QL	(Laundry)			
1-47-1-Q	LAUNDRY		1 CO2	
CUI=QO	(Office Spaces)			
1-73-1-Q	ENGINEERS OFFICE			
1-82-3-Q	SHIP AND SUPPLY OFFICE			
01-61-1-Q	CO OFFICE			
CUI=QS	(Shops)			
1-12-0-Q	ANCHOR WINDLASS RM AND BOSUN'S WORKSHOP		1 PKP	
1-82-2-Q	FORWARD REPAIR #2		1 CO2, 1 PKP	
1-82-4-Q	ENGINEERS WORKSHOP		1 CO2, 1 PKP	
1-90-2-Q	ELCTRICIANS WORKSHOP		1 CO2	
01-103-0-Q	AVIONICS SHOP		1 CO2	
2-40-1-Q	ORDNANCE WORKSHOP			

Plan ID	Compartment Name	Automated Systems	Manual Firefighting Equipment	
			Portable Extinguishers	Hose/3% AFFF
3-152-2-E	ENGINEERS WORK SPACE			
2-221-1-Q	AFT REPAIR #3		1 CO2, 1 PKP	
CUI=TH	(Trunks/Hoists/Dumbwaiters)			
1-55-1	VENT SHAFT			
1-63-1	AC&WW TRUNK			
3-165-1-Q	SERVICE ELEVATOR TRUNK			
01-55-1	VENT SHAFT			
01-63-1	AC & WW TRUNK			
01-103-1-Q	MACHINERY VENT PLENUM COMPT			
01-103-2-Q	MACHINERY VENT PLENUM COMPT			
02-55-1	VENT SHAFT			
2-58-1	WW & AC TRUNK			
CUI=TU	(Stacks/Engine Uptakes)			
1-109-2	UPTAKE			
1-110-1	UPTAKE			
01-109-2	UPTAKE			
01-110-1	UPTAKE			
02-106-1-Q	STACK			
02-106-2-Q	STACK			
CUI=V	(Voids/Cofferdams)			
1-61-1	VOID			
01-61-1	VOID			
CUI=W	(Water Tank (empty))			
3-77-0-W	WATER			

Table B.6.1 Probability of Flame Termination: Passive and Automated Measures

Plan ID	Compartment Name	I Values			A Values		
		EB	TBAR	DBAR	EB	TBAR	DBAR
CUI=AG	(Gear Locker) Frequency of EB=0.0010						
1-56-1-Q	LOCKER	67	73	43	0	0	0
1-62-2-Q	SEABAG LKR	21	33	16	0	0	0
1-65-2-Q	FOUL WEATHER AND LIFE VEST LKR	21	33	16	0	0	0
1-95-1-Q	LIFE JACKET LOCKER	21	33	16	0	0	0
1-117-3-Q	RECREATION LKR	29	33	16	0	0	0
1-201-1-Q	LIFE JACKET LCKR	21	33	16	0	0	0
1-205-1-Q	FOUL WEATHER LIFE VEST LKR	21	33	16	0	0	0
2-80-1-Q	CG LKR	67	33	16	0	0	0
2-165-1-Q	SEABAG LKR	21	33	16	0	0	0
2-186-2-Q	SEA BAG LKR	21	33	16	0	0	0
CUI=AR	(Refrigerated Storage) Frequency of EB=0.0009						
3-175-0-A	REFRIGERATED STORES	49	84	56	0	0	0
CUI=AS	(Storeroom) Frequency of EB=0.0009						
1-53-1-Q	MOVIE LKR	28	73	43	0	0	0
1-58-1-L	CREWS LOCKER SPACE	53	42	23	0	0	0
1-103-3-A	ELECTRONIC STORES	39	42	23	0	0	0
1-103-4-A	ENGINEERS TOOL RM	58	42	23	0	0	0
1-121-2-Q	SHIP STORES	43	38	19	0	0	0
1-169-1-L	MEDICAL STORES	39	42	23	0	0	0
1-186-0-A	ENGINEERS STORES	39	42	23	0	0	0
02-106-0-Q	ELEC EQPT SPACE AND STRM	39	50	35	0	0	0
3-26A-0-A	STORES	39	42	23	0	0	0
3-169-2-A	STOREROOM	49	33	16	0	0	0
2-26A-0-A	STOREROOMS	39	42	23	0	0	0
2-17-0-A	BOSUN STORES	39	42	23	0	0	0
2-59-4-L	CREWS LOCKER SPACE	53	42	23	0	0	0
2-64-1-L	CREWS LOCKER SPACE	53	42	23	0	0	0
2-175-0-L	CREW LOCKER SPACE	53	42	23	0	0	0
2-194-0-L	CREW LOCKER SPACE	53	42	23	0	0	0
2-207A-0-A	STORAGE AREA	49	42	23	0	0	0
CUI=C	(Ship Control/Communications) Frequency of EB=0.0012						
1-26-1-C	GUN CONTROL BOOTH	67	42	23	0	0	0
02-63-0-Q	SENSOR ROOM AND COMMAND SUPPORT CENTER	40	42	23	0	0	0
02-48-0-C	PILOTHOUSE	43	42	23	0	0	0
3-47-0-C	COMMUNICATIONS CENTER	28	42	23	0	0	0
2-47-1-C	IC ROOM	67	42	23	0	0	0
3-152-0-E	ENGINEERING CONTROL CENTER	67	42	23	0	0	0
CUI=EM	(Main Propulsion - Mechanical) Frequency of EB=0.0272						
3-103-0-E	ENGINE ROOM	44	47	25	49	49	24
3-152A-0-E	ENGINE ROOM EXT	44	47	25	49	49	24
CUI=K	(Hazardous Material Storage) Frequency of EB=0.0013						
1-5-0-K	FLAMMABLE LIQ. STOREROOM	25	16	8	71	71	35
CUI=L1	(Senior Officer's Cabin) Frequency of EB=0.0008						
01-47-2-L	XO STATEROOM	56	58	24	0	0	0
01-47-5-L	CO STATEROOM	56	58	24	0	0	0

Plan ID	Compartment Name	I Values			A Values		
		EB	TBAR	DBAR	EB	TBAR	DBAR
01-58-2-L	EO STATEROOM	56	58	24	0	0	0
01-68-3-L	WARDROOM STATEROOM	56	58	24	0	0	0
01-82-1-L	PASSENGER STATEROOM	56	58	24	0	0	0
CUI=L2	(Officer/CPO Quarters) Frequency of EB=0.0008						
1-165-2-L	CPO STATEROOM	47	53	29	0	0	0
1-165-4-L	CPO STATEROOM	47	53	29	0	0	0
1-177-0-L	CPO STATEROOM	47	53	29	0	0	0
1-199-0-L	CPO STATEROOM	47	53	29	0	0	0
1-199-2-L	CPO STATEROOM	47	53	29	0	0	0
01-68-4-L	WARDROOM STATEROOM	47	53	29	0	0	0
01-84-2-L	WARDROOM STATEROOM	47	53	29	0	0	0
01-85-0-L	WARDROOM STATEROOM	47	53	29	0	0	0
CUI=L5	(Crews Berthing) Frequency of EB=0.0008						
1-61-2-L	CREWS BERTHING	40	42	25	0	0	0
2-47-0-L	CREWS BERTHING	40	42	25	0	0	0
2-66-1-L	CREWS BERTHING	40	42	25	0	0	0
2-165-3-L	CREW BERTHING AREA	40	42	25	0	0	0
2-186-4-L	CREW BERTHING	40	42	25	0	0	0
CUI=LL	(Wardroom/Mess/Lounge Areas) Frequency of EB=0.0008						
1-117-0-L	CREW MESS	59	42	23	0	0	0
1-117-2-L	WARDROOM	50	42	23	0	0	0
1-165-3-L	CPO LOUNGE	40	42	23	0	0	0
2-72-2-L	CREWS LOUNGE	50	42	23	0	0	0
2-165-2-L	CREWS LOUNGE	50	42	23	0	0	0
2-186-1-L	CREW LOUNGE	50	42	23	0	0	0
CUI=LM	(Medical/Dental Spaces) Frequency of EB=0.0004						
1-179-1-L	DISPENSARY	39	42	23	0	0	0
CUI=LP	(Passageway/Staircase/Vestibule) Frequency of EB=0.0001						
1-26-2-L	PASSAGEWAY	84	78	70	0	0	0
1-47-0-L	PASSAGEWAY	84	78	70	0	0	0
1-62-2-L	STAIRWAY	84	78	70	0	0	0
1-63-0-L	PASASGEWAY	84	78	70	0	0	0
1-82-1-L	PASSAGEWAY	84	78	70	0	0	0
1-95-1-L	STAIRWAY	84	78	70	0	0	0
1-96-1-L	PASSAGEWAY	84	78	70	0	0	0
1-103-1-L	PASSAGEWAY	84	78	70	0	0	0
1-103-2-L	VESTIBULE	77	78	70	0	0	0
1-113-2-L	PASSAGEWAY	84	78	70	0	0	0
1-165-0-L	PASSAGEWAY	84	78	70	0	0	0
1-186-0-L	PASSAGEWAY	84	78	70	0	0	0
1-207-1-L	VESTIBULE	77	78	70	0	0	0
01-63A-2-L	STAIRWAY	87	78	70	0	0	0
01-47-1-L	VESTIBULE	77	78	70	0	0	0
01-52-0-L	PASSAGEWAY	84	78	70	0	0	0
01-68-0-L	PASSAGEWAY	84	78	70	0	0	0
01-98-0-L	PASSAGEWAY	84	78	70	0	0	0
02-65A-4-L	STAIRWAY	87	78	70	0	0	0
02-63-2-L	PASSAGEWAY	84	78	70	0	0	0

Plan ID	Compartment Name	I Values			A Values		
		EB	TBAR	DBAR	EB	TBAR	DBAR
02-65-2-L	STAIRWAY	87	78	70	0	0	0
3-62-2-L	STAIRWAY	87	78	70	0	0	0
3-94-1-L	STAIRWAY	87	78	70	0	0	0
2-56-0-L	PASSAGEWAY	84	78	70	0	0	0
2-64-2-L	STAIRWAY	87	78	70	0	0	0
2-95-1-L	STAIRWAY	87	78	70	0	0	0
2-178-1-L	STAIRWAY	87	78	70	0	0	0
2-199-1-L	STAIRWAY	87	78	70	0	0	0
2-210-1-L	STAIRWAY	87	78	70	0	0	0
CUI=LW	(Sanitary Spaces) Frequency of EB=0.0002						
1-51-2-L	SANITARY SPACE	88	79	63	0	0	0
1-174-2-L	SANITARY SPACE	88	79	63	0	0	0
1-186-4-L	SANITARY SPACE	88	79	63	0	0	0
01-47-3-L	SANITARY SPACE	88	79	63	0	0	0
01-47-4-L	SANITARY SPACE	88	79	63	0	0	0
01-68-2-L	SANITARY SPACE	88	79	63	0	0	0
01-81-1-L	SANITARY SPACE	88	79	63	0	0	0
01-89-2-L	SANITARY SPACE	88	79	63	0	0	0
01-94-2-L	DECONTAMINATION SHOWER	88	79	63	0	0	0
02-72-2-L	SANITARY SPACE	88	79	63	0	0	0
2-58-1-L	SANITARY SPACE	88	79	63	0	0	0
2-59-2-L	SANITARY SPACE	88	79	63	0	0	0
2-75-0-L	SANITARY SPACE	88	79	63	0	0	0
3-160-2-L	SANITARY SPACE	88	79	63	0	0	0
2-165-0-L	SANITARY SPACE	88	79	63	0	0	0
2-186-0-L	SANITARY SPACE	88	79	63	0	0	0
CUI=QA	(Aux Machinery Spaces) Frequency of EB=0.0029						
1-186-2-Q	COMPUTER ROOM	66	50	35	58	58	29
1-207-3-J	JP-5 FUELING	36	33	16	58	58	29
01-94-1-Q	WINCH MACH. SPACE	58	50	35	58	58	29
3-82-0-E	AUXILIARY MACHINE SPACE NO. 2	44	50	35	58	58	29
4-186-0-J	JP-5 PUMP ROOM	36	50	35	58	58	29
2-82-0-E	AMS NO 1	44	50	35	58	58	29
3-228-0-E	STEERING GEAR ROOM	73	50	35	58	58	29
CUI=QF	(Fan Room) Frequency of EB=0.0004						
1-43-2-Q	FAN ROOM	66	58	43	0	0	0
1-117-1-Q	FAN ROOM	66	58	43	0	0	0
1-207-2-Q	FAN ROOM	66	58	43	0	0	0
02-45-0-Q	FAN SPACE	66	58	43	0	0	0
2-207-1-Q	FAN ROOM	66	58	43	0	0	0
CUI=QG	(Galley/Pantry/Scullery) Frequency of EB=0.0026						
1-129-2-Q	SCULLERY	58	73	43	85	85	42
1-141-2-Q	GALLEY	58	73	43	85	85	42
1-186-3-Q	TRASH COMPACTOR SPACE	49	73	43	85	85	42
CUI=QL	(Laundry) Frequency of EB=0.0031						
1-47-1-Q	LAUNDRY	32	26	15	0	0	0
CUI=QO	(Office Spaces) Frequency of EB=0.0004						
1-73-1-Q	ENGINEERS OFFICE	43	38	19	0	0	0
1-82-3-Q	SHIP AND SUPPLY OFFICE	43	38	19	0	0	0

Plan ID	Compartment Name	I Values			A Values		
		EB	TBAR	DBAR	EB	TBAR	DBAR
01-61-1-Q	CO OFFICE	35	38	19	0	0	0
CUI=QS	(Shops) Frequency of EB=0.0018						
1-12-0-Q	ANCHOR WINDLASS RM AND BOSUN'S WORKSHOP	39	47	25	0	0	0
1-82-2-Q	FORWARD REPAIR #2	32	47	25	0	0	0
1-82-4-Q	ENGINEERS WORKSHOP	43	47	25	0	0	0
1-90-2-Q	ELCTRICIANS WORKSHOP	39	47	25	0	0	0
01-103-0-Q	AVIONICS SHOP	97	47	25	0	0	0
2-40-1-Q	ORDNANCE WORKSHOP	66	50	35	0	0	0
3-152-2-E	ENGINEERS WORK SPACE	39	47	25	0	0	0
2-221-1-Q	AFT REPAIR #3	35	58	43	0	0	0
CUI=TH	(Trunks/Hoists/Dumbwaiters) Frequency of EB=0.0001						
1-55-1	VENT SHAFT	97	100	57	0	0	0
1-63-1	AC&WW TRUNK	97	100	57	0	0	0
3-165-1-Q	SERVICE ELEVATOR TRUNK	94	100	57	0	0	0
01-55-1	VENT SHAFT	97	100	57	0	0	0
01-63-1	AC & WW TRUNK	97	100	57	0	0	0
01-103-1-Q	MACHINERY VENT PLENUM COMPT	97	100	57	0	0	0
01-103-2-Q	MACHINERY VENT PLENUM COMPT	97	100	57	0	0	0
02-55-1	VENT SHAFT	97	100	57	0	0	0
2-58-1	WW & AC TRUNK	97	100	57	0	0	0
CUI=TU	(Stacks/Engine Uptakes) Frequency of EB=0.0013						
1-109-2	UPTAKE	36	35	19	0	0	0
1-110-1	UPTAKE	36	35	19	0	0	0
01-109-2	UPTAKE	36	35	19	0	0	0
01-110-1	UPTAKE	36	35	19	0	0	0
02-106-1-Q	STACK	36	35	19	0	0	0
02-106-2-Q	STACK	36	35	19	0	0	0
CUI=V	(Voids/Cofferdams) Frequency of EB=0.0001						
1-61-1	VOID	99	99	99	0	0	0
01-61-1	VOID	99	99	99	0	0	0
CUI=W	(Water Tank (empty)) Frequency of EB=0.0004						
3-77-0-W	WATER	100	100	100	0	0	0

Table B.6.1.1 Detailed Spreadsheet for I-Values Calculations

Plan ID	CUI	Compartment Name	Iebar	Icbar	Irbar	Ibar	I|EB
1-117-3-Q	AG	RECREATION LOCKER	0.8	0.9	0.99	0.71	0.29
1-201-1-Q	AG	LIFE JACKET LOCKER	0.85	0.95	0.99	0.80	0.20
1-95-1-Q	AG	LIFE JACKET LOCKER	0.85	0.95	0.99	0.80	0.20
02-96-0-M	AG	SMALL ARMS LOCKER	0.6	0.7	0.8	0.34	0.66
2-186-2-Q	AG	SEA BAG LOCKER	0.85	0.95	0.99	0.80	0.20
1-62-2-Q	AG	SEA BAG LOCKER	0.85	0.95	0.99	0.80	0.20
1-65-2-Q	AG	FOUL WEATHER & LIFE VEST LKR	0.85	0.95	0.99	0.80	0.20
1-205-1-Q	AG	FOUL WEATHER & LIFE VEST LKR	0.85	0.95	0.99	0.80	0.20
1-53-1-Q	AG	MOVIE LOCKER	0.9	0.9	0.9	0.73	0.27
1-56-1-Q	AG	CG LOCKER	0.6	0.7	0.8	0.34	0.66
2-80-1-Q	AG	CG LOCKER	0.6	0.7	0.8	0.34	0.66
3-175-0-A	AR	REFRIGERATED STORES	0.75	0.8	0.85	0.51	0.49
1-82-2-Q	AS	FORWARD REPAIR #2	0.85	0.85	0.95	0.69	0.31
2-221-1-Q	AS	AFT REPAIR #3	0.85	0.85	0.95	0.69	0.31
1-121-2-Q	AS	SHIP STORE	0.8	0.85	0.9	0.61	0.39
1-103-4-A	AS	ENGINEERS TOOL RM	0.7	0.75	0.8	0.42	0.58
02-106-0-Q	AS	ELEC EQPT SPACE AND STRM	0.8	0.85	0.9	0.61	0.39
1-186-0-A	AS	ENGINEERS STORES	0.8	0.85	0.9	0.61	0.39
1-103-3-A	AS	ELECTRONIC STORES	0.8	0.85	0.9	0.61	0.39
2-17-0-A	AS	BOSUN STORES	0.8	0.85	0.9	0.61	0.39
1-169-1-L	AS	MEDICAL STORES	0.8	0.85	0.9	0.61	0.39
2-26A-0-A	AS	STOREROOMS	0.8	0.85	0.9	0.61	0.39
3-26A-0-A	AS	STOREROOMS	0.8	0.85	0.9	0.61	0.39
2-207A-0-A	AS	STOREROOM	0.75	0.8	0.85	0.51	0.49
3-169-2-A	AS	STOREROOM	0.75	0.8	0.85	0.51	0.49
1-58-1-L	AS	CREWS LOCKER SPACE	0.95	0.99	0.5	0.47	0.53
2-175-0-L	AS	CREWS LOCKER SPACE	0.95	0.99	0.5	0.47	0.53
2-194-0-L	AS	CREWS LOCKER SPACE	0.95	0.99	0.5	0.47	0.53
2-59-4-L	AS	CREWS LOCKER SPACE	0.95	0.99	0.5	0.47	0.53
2-64-1-L	AS	CREWS LOCKER SPACE	0.95	0.99	0.5	0.47	0.53
02-48-0-C	C	PILOTHOUSE	0.75	0.85	0.9	0.57	0.43
02-63-0-Q	C	SENSOR ROOM AND COMMAND SUPF	0.75	0.85	0.95	0.61	0.39
1-26-1-C	C	GUN CONTROL BOOTH	0.6	0.7	0.8	0.34	0.66
2-47-1-C	C	IC ROOM	0.6	0.7	0.8	0.34	0.66
3-152-0-E	C	ENGINEERING CONTROL CENTER	0.85	0.75	0.7	0.45	0.55
3-47-0-C	C	COMMUNICATIONS CENTER	0.85	0.9	0.95	0.73	0.27
3-103-0-E	EM	ENGINE ROOM	0.7	0.85	0.95	0.57	0.43
3-152A-0-E	EM	ENGINE ROOM EXT	0.7	0.85	0.95	0.57	0.43
4-165-4-F	F	DIESEL OIL TANK					
4-65-1-F	F	FUEL TANK					
4-190-0-J	J	FUEL STORAGE AREA					
1-5-0-K	K	FLAMMABLE LIQ. STOREROOM	0.8	0.95	0.99	0.75	0.25
01-47-2-L	L1	XO STATEROOM	0.7	0.8	0.8	0.45	0.55
01-47-5-L	L1	CO STATEROOM	0.7	0.8	0.8	0.45	0.55
01-58-2-L	L1	EO STATEROOM	0.7	0.8	0.8	0.45	0.55
01-68-3-L	L1	WARDROOM STATEROOM	0.7	0.8	0.8	0.45	0.55
01-82-1-L	L1	PASSENGER STATEROOM	0.7	0.8	0.8	0.45	0.55
01-68-4-L	L2	WARDROOM STATEROOM	0.7	0.85	0.9	0.54	0.46
01-84-2-L	L2	WARDROOM STATEROOM	0.7	0.85	0.9	0.54	0.46
01-85-0-L	L2	WARDROOM STATEROOM	0.7	0.85	0.9	0.54	0.46

Table B.6.1.1 Detailed Spreadsheet for I-Values Calculations

Plan ID	CUI	Compartment Name	Iebar	Icbar	Irbar	Ibar	I|EB
1-165-2-L	L2	CPO STATEROOM	0.7	0.85	0.9	0.54	0.46
1-165-4-L	L2	CPO STATEROOM	0.7	0.85	0.9	0.54	0.46
1-177-0-L	L2	CPO STATEROOM	0.7	0.85	0.9	0.54	0.46
1-199-0-L	L2	CPO STATEROOM	0.7	0.85	0.9	0.54	0.46
1-199-2-L	L2	CPO STATEROOM	0.7	0.85	0.9	0.54	0.46
1-61-2-L	L5	CREWS BERTHING	0.75	0.85	0.95	0.61	0.39
2-165-3-L	L5	CREWS BERTHING	0.75	0.85	0.95	0.61	0.39
2-186-4-L	L5	CREWS BERTHING	0.75	0.85	0.95	0.61	0.39
2-47-0-L	L5	CREWS BERTHING	0.75	0.85	0.95	0.61	0.39
2-66-1-L	L5	CREWS BERTHING	0.75	0.85	0.95	0.61	0.39
1-117-0-L	LL	CREWS MESS	0.65	0.75	0.85	0.41	0.59
1-117-2-L	LL	WARDROOM	0.7	0.8	0.9	0.50	0.50
1-165-3-L	LL	CPO LOUNGE	0.75	0.85	0.95	0.61	0.39
2-165-2-L	LL	CREWS LOUNGE	0.7	0.8	0.9	0.50	0.50
2-186-1-L	LL	CREWS LOUNGE	0.7	0.8	0.9	0.50	0.50
2-72-2-L	LL	CREWS LOUNGE	0.7	0.8	0.9	0.50	0.50
1-179-1-L	LM	DISPENSARY	0.85	0.85	0.9	0.65	0.35
01-47-1-L	LP	VESTIBULE	0.6	0.6	0.65	0.23	0.77
1-103-2-L	LP	VESTIBULE	0.6	0.6	0.65	0.23	0.77
1-207-1-L	LP	VESTIBULE	0.6	0.6	0.65	0.23	0.77
01-63A-2-L	LP	STAIRWAY	0.6	0.55	0.4	0.13	0.87
02-65-2-L	LP	STAIRWAY	0.6	0.55	0.4	0.13	0.87
02-65A-4-L	LP	STAIRWAY	0.6	0.55	0.4	0.13	0.87
1-62-2-L	LP	STAIRWAY	0.6	0.55	0.4	0.13	0.87
1-95-1-L	LP	STAIRWAY	0.6	0.55	0.4	0.13	0.87
2-178-1-L	LP	STAIRWAY	0.6	0.55	0.4	0.13	0.87
2-210-1-L	LP	STAIRWAY	0.6	0.55	0.4	0.13	0.87
2-64-2-L	LP	STAIRWAY	0.6	0.55	0.4	0.13	0.87
2-95-1-L	LP	STAIRWAY	0.6	0.55	0.4	0.13	0.87
3-62-2-L	LP	STAIRWAY	0.6	0.55	0.4	0.13	0.87
3-94-1-L	LP	STAIRWAY	0.6	0.55	0.4	0.13	0.87
01-52-0-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
01-68-0-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
01-98-0-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
02-63-2-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
1-103-1-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
1-113-2-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
1-165-0-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
1-186-0-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
1-26-2-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
1-47-0-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
1-63-0-L	LP	PASASGEWAY	0.5	0.55	0.6	0.17	0.84
1-82-1-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
1-96-1-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
2-56-0-L	LP	PASSAGEWAY	0.5	0.55	0.6	0.17	0.84
01-47-3-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
01-47-4-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
01-68-2-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
01-81-1-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
01-89-2-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88

Table B.6.1.1 Detailed Spreadsheet for I-Values Calculations

Plan ID	CUI	Compartment Name	Iebar	Icbar	Irbar	Ibar	I|EB
02-72-2-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
1-174-2-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
1-186-4-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
1-51-2-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
2-165-0-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
2-186-0-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
2-58-1-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
2-59-2-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
2-75-0-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
3-160-2-L	LW	SANITARY SPACE	0.45	0.5	0.55	0.12	0.88
01-94-2-L	LW	DECONTAMINATION SHOWER	0.45	0.5	0.55	0.12	0.88
1-26-0-M	M	MAGAZINE					
2-214-2-M	M	SMALL ARMS MAGAZINE					
01-94-1-Q	QA	WINCH MACHINERY ROOM	0.7	0.75	0.8	0.42	0.58
1-186-2-Q	QA	COMPUTER ROOM	0.65	0.7	0.75	0.34	0.66
3-228-0-E	QA	STEERING GEAR ROOM	0.6	0.65	0.7	0.27	0.73
2-82-0-E	QA	AUX MACHINERY SPACE #1	0.7	0.9	0.9	0.57	0.43
3-82-0-E	QA	AUX MACHINERY SPACE #2	0.7	0.9	0.9	0.57	0.43
1-207-3-J	QA	JP-5 FUELING	0.8	0.9	0.9	0.65	0.35
4-186-0-J	QA	JP-5 PUMP ROOM	0.8	0.9	0.9	0.65	0.35
02-45-0-Q	QF	FAN ROOM	0.65	0.7	0.75	0.34	0.66
1-117-1-Q	QF	FAN ROOM	0.65	0.7	0.75	0.34	0.66
1-207-2-Q	QF	FAN ROOM	0.65	0.7	0.75	0.34	0.66
1-43-2-Q	QF	FAN ROOM	0.65	0.7	0.75	0.34	0.66
2-207-1-Q	QF	FAN ROOM	0.65	0.7	0.75	0.34	0.66
1-129-2-Q	QG	SCULLERY	0.7	0.75	0.8	0.42	0.58
1-141-2-Q	QG	GALLEY	0.7	0.75	0.8	0.42	0.58
1-186-3-Q	QG	TRASH COMPACTOR SPACE	0.75	0.8	0.85	0.51	0.49
01-117-0-Q	QH	HELICOPTER HANGAR					
1-47-1-Q	QL	LAUNDRY	0.8	0.9	0.95	0.68	0.32
01-61-1-Q	QO	CO OFFICE	0.85	0.85	0.9	0.65	0.35
1-73-1-Q	QO	ENGINEERS OFFICE	0.8	0.85	0.85	0.58	0.42
1-82-3-Q	QO	SHIP AND SUPPLY OFFICE	0.8	0.85	0.85	0.58	0.42
01-103-0-Q	QS	AVIONICS SHOP	0.75	0.8	0.85	0.51	0.49
1-12-0-Q	QS	ANCHOR WINDLASS RM AND BOSUN'	0.8	0.85	0.9	0.61	0.39
2-40-1-Q	QS	ORDNANCE WORKSHOP	0.65	0.7	0.75	0.34	0.66
1-82-4-Q	QS	ENGINEERS WORKSHOP	0.8	0.85	0.9	0.61	0.39
1-90-2-Q	QS	ELECTRICIANS WORKSHOP	0.8	0.85	0.9	0.61	0.39
3-152-2-E	QS	ENGINEERS WORK SPACE	0.75	0.8	0.85	0.51	0.49
01-103-1-Q	TH	MACHINERY VENT PLENUM COMPT	0.3	0.3	0.4	0.04	0.96
01-103-2-Q	TH	MACHINERY VENT PLENUM COMPT	0.3	0.3	0.4	0.04	0.96
01-55-1-T	TH	VENT SHAFT	0.3	0.3	0.4	0.04	0.96
02-55-1-T	TH	VENT SHAFT	0.3	0.3	0.4	0.04	0.96
1-55-1-T	TH	VENT SHAFT	0.3	0.3	0.4	0.04	0.96
01-63-1-T	TH	AC & WW TRUNK	0.3	0.3	0.4	0.04	0.96
1-63-1-T	TH	AC & WW TRUNK	0.3	0.3	0.4	0.04	0.96
2-58-1-T	TH	AC & WW TRUNK	0.3	0.3	0.4	0.04	0.96
3-165-1-Q	TH	SERVICE ELEVATOR TRUNK	0.8	0.4	0.2	0.06	0.94
01-109-2-Q	TU	UPTAKE	0.85	0.8	0.95	0.65	0.35
01-110-1-Q	TU	UPTAKE	0.85	0.8	0.95	0.65	0.35

Table B.6.1.1 Detailed Spreadsheet for I-Values Calculations

Plan ID	CUI	Compartment Name	Iebar	Icbar	Irbar	Ibar	I|EB
1-109-2-Q	TU	UPTAKE	0.85	0.8	0.95	0.65	0.35
1-110-1-Q	TU	UPTAKE	0.85	0.8	0.95	0.65	0.35
02-106-1-Q	TU	STACK	0.85	0.8	0.95	0.65	0.35
02-106-2-Q	TU	STACK	0.85	0.8	0.95	0.65	0.35
01-61-1-V	V	VOID	0.25	0.25	0.2	0.01	0.99
1-61-1-V	V	VOID	0.25	0.25	0.2	0.01	0.99
3-77-0-W	W	WATER TANK	0	0	0	0.00	1.00

Table B.6.1.2 Detailed Spreadsheed for A-Values Calculations

Plan ID	CUI	Compartment Name	dan	nan	san	An	fap	vap	pap	Ap	saa	aaa	daa	Aa	qae	cae	bae	Ae	AIEB
1-5-0-K	K	FLAMMABLE LIQUIDS STOREROOM	0.95	0.99	0.99	0.93	1	1	1	1.00	0.99	0.95	0.9	0.85	1	1	0.9	0.90	0.71
4-186-0-J	QA	JP-5 PUMP ROOM	0.95	0.99	0.99	0.93	0.9	1	1	0.90	0.99	0.95	0.9	0.85	0.95	0.95	0.9	0.81	0.58
1-141-2-Q	QG	GALLEY	0.99	0.99	0.99	0.97	1	0.95	0.95	0.90	1	0.99	0.99	0.98	1	1	0.99	0.99	0.85

An=dan*nan*san where dan=detection of fire, nan=notification of Bridge, and san=sound the alarm
Ap=fap*vap*cap where fap=secure the fuel supply, vap=secure the ventilation, and cap=secure the electrical power
Aa=saa*aaa*daa where saa=alignment of automated system, aaa=agent discharges from nozzle, and daa=agent discharges on the fire
Ae=qae*cae*bae where qae=quantity of agent is adequate, cae=concentration of agent is adequate, and bae=blackout occurs
AIEB=An*Ap*Aa*Ae where An=Notification, Ap=Preparation, Aa=Agent Application, and Ae=Fire Extinguishment

Installed Automated Systems:
Fixed CO2 Total Flooding System in the Flammable Liquids Storeroom and the JP-5 Pump Room and an Aqueous Potassium Carbonate System in the Galley

Notes:
The Galley is occupied 30% of the time, however, it is assumed that if a grease fire occurs on the Galley stove, it is assumed that a crew member is present in the Galley.
The probability of the Galley's automated system successfully extinguishing the fire is based on grease fires on the stove only.

Table B.6.2 Probability of Flame Termination: Manual Measures (In Port)

Plan ID	Compartment Name	M Values		
		EB	TBAR	DBAR
CUI=AG	(Gear Locker) Frequency of EB=0.0010			
1-56-1-Q	LOCKER	6	7	3
1-62-2-Q	SEABAG LKR	3	3	1
1-65-2-Q	FOUL WEATHER AND LIFE VEST LKR	10	12	6
1-95-1-Q	LIFE JACKET LOCKER	3	3	1
1-117-3-Q	RECREATION LKR	4	4	2
1-201-1-Q	LIFE JACKET LCKR	3	3	1
1-205-1-Q	FOUL WEATHER LIFE VEST LKR	3	3	1
2-80-1-Q	CG LKR	3	3	1
2-165-1-Q	SEABAG LKR	3	3	1
2-186-2-Q	SEA BAG LKR	3	3	1
CUI=AR	(Refrigerated Storage) Frequency of EB=0.0009			
3-175-0-A	REFRIGERATED STORES	20	24	16
CUI=AS	(Storeroom) Frequency of EB=0.0009			
1-53-1-Q	MOVIE LKR	46	92	46
1-58-1-L	CREWS LOCKER SPACE	13	26	13
1-103-3-A	ELECTRONIC STORES	28	56	28
1-103-4-A	ENGINEERS TOOL RM	27	54	27
1-121-2-Q	SHIP STORES	3	6	3
1-169-1-L	MEDICAL STORES	25	50	25
1-186-0-A	ENGINEERS STORES	28	56	28
02-106-0-Q	ELEC EQPT SPACE AND STRM	50	100	50
3-26A-0-A	STORES	12	24	12
3-169-2-A	STOREROOM	25	50	25
2-26A-0-A	STOREROOMS	12	24	12
2-17-0-A	BOSUN STORES	15	30	15
2-59-4-L	CREWS LOCKER SPACE	21	42	21
2-64-1-L	CREWS LOCKER SPACE	42	84	42
2-175-0-L	CREW LOCKER SPACE	13	26	13
2-194-0-L	CREW LOCKER SPACE	13	26	13
2-207A-0-A	STORAGE AREA	21	42	21
CUI=C	(Ship Control/Communications) Frequency of EB=0.0012			
1-26-1-C	GUN CONTROL BOOTH	16	17	9
02-63-0-Q	SENSOR ROOM AND COMMAND SUPPORT CENTER	29	31	17
02-48-0-C	PILOTHOUSE	42	46	25
3-47-0-C	COMMUNICATIONS CENTER	31	34	18
2-47-1-C	IC ROOM	20	22	12
3-152-0-E	ENGINEERING CONTROL CENTER	43	47	25
CUI=EM	(Main Propulsion - Mechanical) Frequency of EB=0.0272			
3-103-0-E	ENGINE ROOM	10	13	6
3-152A-0-E	ENGINE ROOM EXT	6	7	3
CUI=K	(Hazardous Material Storage) Frequency of EB=0.0013			
1-5-0-K	FLAMMABLE LIQ. STOREROOM	4	4	2
CUI=L1	(Senior Officer's Cabin) Frequency of EB=0.0008			

Plan ID	Compartment Name	M Values		
		EB	TBAR	DBAR
01-47-2-L	XO STATEROOM	40	52	24
01-47-5-L	CO STATEROOM	42	54	25
01-58-2-L	EO STATEROOM	40	52	24
01-68-3-L	WARDROOM STATEROOM	42	54	25
01-82-1-L	PASSENGER STATEROOM	42	54	25
CUI=L2	(Officer/CPO Quarters) Frequency of EB=0.0008			
1-165-2-L	CPO STATEROOM	13	20	9
1-165-4-L	CPO STATEROOM	4	6	2
1-177-0-L	CPO STATEROOM	13	20	9
1-199-0-L	CPO STATEROOM	4	6	2
1-199-2-L	CPO STATEROOM	4	6	2
01-68-4-L	WARDROOM STATEROOM	38	60	26
01-84-2-L	WARDROOM STATEROOM	38	60	26
01-85-0-L	WARDROOM STATEROOM	40	64	28
CUI=L5	(Crews Berthing) Frequency of EB=0.0008			
1-61-2-L	CREWS BERTHING	40	80	36
2-47-0-L	CREWS BERTHING	40	80	36
2-66-1-L	CREWS BERTHING	42	84	37
2-165-3-L	CREW BERTHING AREA	42	84	37
2-186-4-L	CREW BERTHING	30	60	27
CUI=LL	(Wardroom/Mess/Lounge Areas) Frequency of EB=0.0008			
1-117-0-L	CREW MESS	33	41	19
1-117-2-L	WARDROOM	28	35	16
1-165-3-L	CPO LOUNGE	45	56	27
2-72-2-L	CREWS LOUNGE	5	6	3
2-165-2-L	CREWS LOUNGE	15	18	9
2-186-1-L	CREW LOUNGE	25	31	15
CUI=LM	(Medical/Dental Spaces) Frequency of EB=0.0004			
1-179-1-L	DISPENSARY	15	18	9
CUI=LP	(Passageway/Staircase/Vestibule) Frequency of EB=0.0001			
1-26-2-L	PASSAGEWAY	39	42	35
1-47-0-L	PASSAGEWAY	56	61	50
1-62-2-L	STAIRWAY	56	61	50
1-63-0-L	PASASGEWAY	56	61	50
1-82-1-L	PASSAGEWAY	66	72	59
1-95-1-L	STAIRWAY	66	72	59
1-96-1-L	PASSAGEWAY	66	72	59
1-103-1-L	PASSAGEWAY	66	72	59
1-103-2-L	VESTIBULE	66	72	59
1-113-2-L	PASSAGEWAY	66	72	59
1-165-0-L	PASSAGEWAY	56	61	50
1-186-0-L	PASSAGEWAY	56	61	50
1-207-1-L	VESTIBULE	56	61	50
01-63A-2-L	STAIRWAY	56	61	50
01-47-1-L	VESTIBULE	33	36	29
01-52-0-L	PASSAGEWAY	56	61	50
01-68-0-L	PASSAGEWAY	56	61	50

Plan ID	Compartment Name	M Values		
		EB	TBAR	DBAR
01-98-0-L	PASSAGEWAY	39	42	35
02-65A-4-L	STAIRWAY	33	36	29
02-63-2-L	PASSAGEWAY	39	42	35
02-65-2-L	STAIRWAY	39	42	35
3-62-2-L	STAIRWAY	7	7	6
3-94-1-L	STAIRWAY	5	5	4
2-56-0-L	PASSAGEWAY	56	61	50
2-64-2-L	STAIRWAY	6	6	5
2-95-1-L	STAIRWAY	7	7	6
2-178-1-L	STAIRWAY	56	61	50
2-199-1-L	STAIRWAY	56	61	50
2-210-1-L	STAIRWAY	43	47	38
CUI=LW	(Sanitary Spaces) Frequency of EB=0.0002			
1-51-2-L	SANITARY SPACE	46	50	41
1-174-2-L	SANITARY SPACE	43	47	38
1-186-4-L	SANITARY SPACE	39	42	35
01-47-3-L	SANITARY SPACE	33	36	29
01-47-4-L	SANITARY SPACE	33	36	29
01-68-2-L	SANITARY SPACE	39	42	35
01-81-1-L	SANITARY SPACE	39	42	35
01-89-2-L	SANITARY SPACE	39	42	35
01-94-2-L	DECONTAMINATION SHOWER	33	36	29
02-72-2-L	SANITARY SPACE	39	42	35
2-58-1-L	SANITARY SPACE	46	50	41
2-59-2-L	SANITARY SPACE	46	50	41
2-75-0-L	SANITARY SPACE	46	50	41
3-160-2-L	SANITARY SPACE	39	42	35
2-165-0-L	SANITARY SPACE	46	50	41
2-186-0-L	SANITARY SPACE	46	50	41
CUI=QA	(Aux Machinery Spaces) Frequency of EB=0.0029			
1-186-2-Q	COMPUTER ROOM	3	3	2
1-207-3-J	JP-5 FUELING	1	1	0
01-94-1-Q	WINCH MACH. SPACE	2	2	1
3-82-0-E	AUXILIARY MACHINE SPACE NO. 2	6	6	4
4-186-0-J	JP-5 PUMP ROOM	9	9	6
2-82-0-E	AMS NO 1	10	11	7
3-228-0-E	STEERING GEAR ROOM	11	12	8
CUI=QF	(Fan Room) Frequency of EB=0.0004			
1-43-2-Q	FAN ROOM	2	5	1
1-117-1-Q	FAN ROOM	2	5	1
1-207-2-Q	FAN ROOM	2	5	1
02-45-0-Q	FAN SPACE	6	15	4
2-207-1-Q	FAN ROOM	2	5	1
CUI=QG	(Galley/Pantry/Scullery) Frequency of EB=0.0026			
1-129-2-Q	SCULLERY	4	5	3
1-141-2-Q	GALLEY	3	4	2
1-186-3-Q	TRASH COMPACTOR SPACE	5	7	4
CUI=QL	(Laundry) Frequency of EB=0.0031			

Plan ID	Compartment Name	M Values		
		EB	TBAR	DBAR
1-47-1-Q	LAUNDRY	11	16	6
CUI=QO	(Office Spaces) Frequency of EB=0.0004			
1-73-1-Q	ENGINEERS OFFICE	4	5	2
1-82-3-Q	SHIP AND SUPPLY OFFICE	3	3	1
01-61-1-Q	CO OFFICE	40	50	24
CUI=QS	(Shops) Frequency of EB=0.0018			
1-12-0-Q	ANCHOR WINDLASS RM AND BOSUN'S WORKSHOP	28	33	16
1-82-2-Q	FORWARD REPAIR #2	30	36	18
1-82-4-Q	ENGINEERS WORKSHOP	36	43	21
1-90-2-Q	ELCTRICIANS WORKSHOP	36	43	21
01-103-0-Q	AVIONICS SHOP	36	43	21
2-40-1-Q	ORDNANCE WORKSHOP	56	67	33
3-152-2-E	ENGINEERS WORK SPACE	39	46	23
2-221-1-Q	AFT REPAIR #3	30	36	18
CUI=TH	(Trunks/Hoists/Dumbwaiters) Frequency of EB=0.0001			
1-55-1	VENT SHAFT	33	39	19
1-63-1	AC&WW TRUNK	33	39	19
3-165-1-Q	SERVICE ELEVATOR TRUNK	33	39	19
01-55-1	VENT SHAFT	33	39	19
01-63-1	AC & WW TRUNK	27	32	16
01-103-1-Q	MACHINERY VENT PLENUM COMPT	33	39	19
01-103-2-Q	MACHINERY VENT PLENUM COMPT	33	39	19
02-55-1	VENT SHAFT	33	39	19
2-58-1	WW & AC TRUNK	27	32	16
CUI=TU	(Stacks/Engine Uptakes) Frequency of EB=0.0013			
1-109-2	UPTAKE	2	2	1
1-110-1	UPTAKE	6	7	3
01-109-2	UPTAKE	2	2	1
01-110-1	UPTAKE	2	2	1
02-106-1-Q	STACK	6	7	3
02-106-2-Q	STACK	6	7	3
CUI=V	(Voids/Cofferdams) Frequency of EB=0.0001			
1-61-1	VOID	41	41	41
01-61-1	VOID	41	41	41
CUI=W	(Water Tank (empty)) Frequency of EB=0.0004			
3-77-0-W	WATER	41	41	41

Table B.6.2.1 Detailed Spreadsheet for M-Values in Port Calculations

Plan ID	CUI	Compartment Name	FRI	Class	Size	dmn	nmn	smn	Mn	fmp	vmp	pmp	Mp	sma	ama	dma	Ma	qme	cme	bme	Me	M[EB
1-117-3-Q	AG	RECREATION LOCKER	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03
1-201-1-Q	AG	LIFE JACKET LOCKER	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03
1-95-1-Q	AG	LIFE JACKET LOCKER	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.9	0.9	1	0.81	1	1	0.95	0.95	0.27
02-96-0-M	AG	SMALL ARMS LOCKER	5	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03
2-186-2-Q	AG	SEA BAG LOCKER	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03
1-62-2-Q	AG	SEA BAG LOCKER	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.3	1	1	0.3	1	1	0.95	0.95	0.10
1-65-2-Q	AG	FOUL WEATHER & LIFE VEST LKR	2	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03
1-205-1-Q	AG	FOUL WEATHER & LIFE VEST LKR	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.46
1-53-1-Q	AG	MOVIE LOCKER	8	A	S	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.06
1-56-1-Q	AG	CG LOCKER	1	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03
2-80-1-Q	AG	CG LOCKER	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.9	0.9	0.9	0.73	1	1	0.8	0.8	0.20
3-175-0-A	AR	REFRIGERATED STORES	5	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.25
1-82-2-Q	AS	FORWARD REPAIR #2	38	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.25
2-221-1-Q	AS	AFT REPAIR #3	8	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	0.9	1	0.09	1	1	0.8	0.8	0.02
1-121-2-Q	AS	SHIP STORE	1	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.9	0.9	1	0.81	1	1	0.8	0.8	0.22
1-103-4-A	AS	ENGINEERS TOOL RM	5	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.50
02-106-0-Q	AS	ELEC EQPT SPACE AND STRM	8	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.28
1-186-0-A	AS	ENGINEERS STORES	6	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.95	0.9	1	0.86	1	1	0.8	0.8	0.28
1-103-3-A	AS	ELECTRONIC STORES	8	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.95	0.9	1	0.86	1	1	0.8	0.8	0.28
2-17-0-A	AS	BOSUN STORES	2	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.15
1-169-1-L	AS	MEDICAL STORES	12	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.25
2-26A-0-A	AS	STOREROOMS	2	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.3	0.9	0.8	0.22	1	1	0.8	0.8	0.12
3-26A-0-A	AS	STOREROOMS	2	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.3	0.9	0.8	0.22	1	1	0.8	0.8	0.12
2-207A-0-A	AS	STOREROOM	4	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.7	0.9	1	0.63	1	1	0.8	0.8	0.21
3-169-2-A	AS	STOREROOM	3	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.5	0.9	1	0.45	1	1	0.8	0.8	0.25
1-58-1-L	AS	CREWS LOCKER SPACE	2	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.13
2-175-0-L	AS	CREWS LOCKER SPACE	2	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.13
2-194-0-L	AS	CREWS LOCKER SPACE	2	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.13
2-59-4-L	AS	CREWS LOCKER SPACE	3	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.5	0.9	1	0.45	1	1	0.8	0.8	0.21
2-64-1-L	AS	CREWS LOCKER SPACE	23	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.42
02-48-0-C	C	PILOTHOUSE	6	C	M	0.5	1	1	0.5	1	0.9	0.9	0.81	0.95	1	0.85	0.81	0.9	0.9	0.8	0.65	0.21
02-63-0-Q	C	SENSOR ROOM AND COMMAND S	10	C	M	0.95	0.9	0.95	0.81	1	0.9	0.9	0.81	1	0.8	0.85	0.68	0.9	0.9	0.8	0.65	0.29
1-26-1-C	C	GUN CONTROL BOOTH	3	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.5	0.9	1	0.45	1	1	0.8	0.8	0.12
2-47-1-C	C	IC ROOM	4	C	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.7	1	1	0.7	0.9	0.9	0.8	0.65	0.16
3-152-0-E	C	ENGINEERING CONTROL CENTER	7	C	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.95	1	1	0.95	0.9	0.9	0.8	0.65	0.21
3-47-0-C	C	COMMUNICATIONS CENTER	7	C	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.95	0.8	0.9	0.68	0.9	0.9	0.8	0.65	0.31
3-103-0-E	EM	ENGINE ROOM	3	B	L	0.95	0.95	0.95	0.86	0.8	0.8	0.8	0.51	0.5	1	0.8	0.4	0.95	0.95	0.65	0.59	0.10
3-152A-0-E	EM	ENGINE ROOM EXT	2	B	L	0.95	0.95	0.95	0.86	0.8	0.8	0.8	0.51	0.3	1	0.8	0.24	0.95	0.95	0.65	0.59	0.06
4-165-4-F	F	DIESEL OIL TANK																				
4-65-1-F	F	FUEL TANK																				
4-190-0-J	J	FUEL STORAGE AREA																				
1-5-0-K	K	FLAMMABLE LIQ. STOREROOM	1	B	L	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.1	0.9	1	0.09	0.95	0.95	0.65	0.59	0.04
01-47-2-L	L1	XO STATEROOM	7	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	0.9	1	0.86	1	1	0.8	0.8	0.40
01-47-5-L	L1	CO STATEROOM	10	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.42

Table B.6.2.1 Detailed Spreadsheet for M-Values In Port Calculations

Plan ID	CUI	Compartment Name	FRI	Class	Size	dmn	nmn	smn	Mn	fmp	vmp	pmp	Mp	sma	ama	dma	Ma	qme	cme	bme	Me	MEB
01-58-2-L	L1	EO STATEROOM	6	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	0.9	1	0.86	1	1	0.8	0.8	0.40
01-68-3-L	L1	WARDROOM STATEROOM	11	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.42
01-82-1-L	L1	PASSENGER STATEROOM	12	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.42
01-68-4-L	L2	WARDROOM STATEROOM	5	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.9	0.9	1	0.81	1	1	0.8	0.8	0.38
01-84-2-L	L2	WARDROOM STATEROOM	5	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.9	0.9	1	0.81	1	1	0.8	0.8	0.38
01-85-0-L	L2	WARDROOM STATEROOM	6	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	0.9	1	0.86	1	1	0.8	0.8	0.40
1-165-2-L	L2	CPO STATEROOM	2	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.13
1-165-4-L	L2	CPO STATEROOM	1	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	0.9	1	0.09	1	1	0.8	0.8	0.04
1-177-0-L	L2	CPO STATEROOM	2	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.13
1-199-0-L	L2	CPO STATEROOM	1	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	0.9	1	0.09	1	1	0.8	0.8	0.04
1-199-2-L	L2	CPO STATEROOM	1	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	0.9	1	0.09	1	1	0.8	0.8	0.04
1-61-2-L	L5	CREWS BERTHING	7	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	1	0.9	0.86	1	1	0.8	0.8	0.40
2-165-3-L	L5	CREWS BERTHING	10	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	0.9	0.9	1	1	0.8	0.8	0.42
2-186-4-L	L5	CREWS BERTHING	4	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.7	1	0.9	0.63	1	1	0.8	0.8	0.30
2-47-0-L	L5	CREWS BERTHING	7	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	1	0.9	0.86	1	1	0.8	0.8	0.40
2-66-1-L	L5	CREWS BERTHING	10	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	0.9	0.9	1	1	0.8	0.8	0.42
1-117-0-L	LL	CREWS MESS	7	A	M	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	0.95	1	0.9	0.86	1	1	0.8	0.8	0.33
1-117-2-L	LL	WARDROOM	7	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.95	1	0.9	0.86	1	1	0.8	0.8	0.28
1-165-3-L	LL	CPO LOUNGE	8	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	1	1	0.95	1	1	0.8	0.8	0.45
2-165-2-L	LL	CREWS LOUNGE	2	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	1	0.9	0.27	1	1	0.95	0.95	0.15
2-186-1-L	LL	CREWS LOUNGE	3	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.5	1	0.9	0.45	1	1	0.95	0.95	0.25
2-72-2-L	LL	CREWS LOUNGE	1	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	1	0.9	0.09	1	1	0.95	0.95	0.05
1-179-1-L	LM	DISPENSARY	3	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.5	0.9	1	0.45	1	1	0.8	0.8	0.15
01-47-1-L	LP	VESTIBULE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
1-103-2-L	LP	VESTIBULE	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
1-207-1-L	LP	VESTIBULE	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
01-63A-2-L	LP	STAIRWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
02-65-2-L	LP	STAIRWAY	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
02-65A-4-L	LP	STAIRWAY	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
1-62-2-L	LP	STAIRWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
1-95-1-L	LP	STAIRWAY	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
2-178-1-L	LP	STAIRWAY	13	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
2-210-1-L	LP	STAIRWAY	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
2-64-2-L	LP	STAIRWAY	1	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.06
2-95-1-L	LP	STAIRWAY	1	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.07
3-62-2-L	LP	STAIRWAY	1	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.07
3-94-1-L	LP	STAIRWAY	1	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.04
01-52-0-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
01-68-0-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
01-98-0-L	LP	PASSAGEWAY	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
02-63-2-L	LP	PASSAGEWAY	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
1-103-1-L	LP	PASSAGEWAY	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
1-113-2-L	LP	PASSAGEWAY	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
1-165-0-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56

Table B.6.2.1 Detailed Spreadsheet for M-Values in Port Calculations

Plan ID	CUI	Compartment Name	FRI	Class	Size	dmn	nmn	smn	Mn	fmp	vmp	pmp	Mp	sma	ama	dma	Ma	qme	cme	bme	Me	M[EB
1-186-0-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
1-26-2-L	LP	PASSAGEWAY	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
1-47-0-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
1-63-0-L	LP	PASASGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
1-82-1-L	LP	PASSAGEWAY	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
1-96-1-L	LP	PASSAGEWAY	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
2-56-0-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
01-47-3-L	LW	SANITARY SPACE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-47-4-L	LW	SANITARY SPACE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-68-2-L	LW	SANITARY SPACE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-81-1-L	LW	SANITARY SPACE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-89-2-L	LW	SANITARY SPACE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
02-72-2-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
1-174-2-L	LW	SANITARY SPACE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
1-186-4-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
1-51-2-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
2-165-0-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
2-186-0-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
2-58-1-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
2-59-2-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
2-75-0-L	LW	SANITARY SPACE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
3-160-2-L	LW	SANITARY SPACE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-94-2-L	LW	DECONTAMINATION SHOWER	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81									
1-26-0-M	M	MAGAZINE																				
2-214-2-M	M	SMALL ARMS MAGAZINE																				
01-94-1-Q	QA	WINCH MACHINERY ROOM	1	B	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.95	0.95	0.8	0.72	0.02
1-186-2-Q	QA	COMPUTER ROOM	1	C	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.9	0.9	0.8	0.65	0.03
3-228-0-E	QA	STEERING GEAR ROOM	2	B	M	0.95	0.95	0.95	0.86	0.9	0.9	0.9	0.73	0.3	0.9	0.9	0.24	0.95	0.95	0.8	0.72	0.11
2-82-0-E	QA	AUX MACHINERY SPACE #1	2	C	M	0.95	0.95	0.95	0.86	0.9	0.9	0.9	0.73	0.3	0.9	0.9	0.24	0.9	0.9	0.8	0.65	0.10
3-82-0-E	QA	AUX MACHINERY SPACE #2	2	C	M	0.6	0.9	0.95	0.51	0.9	0.9	0.9	0.73	0.3	0.9	0.9	0.24	0.9	0.9	0.8	0.65	0.06
1-207-3-J	QA	JP-5 FUELING	1	B	M	0.5	0.9	0.95	0.43	0.7	0.9	0.9	0.57	0.1	0.9	0.9	0.08	0.95	0.95	0.8	0.72	0.01
4-186-0-J	QA	JP-5 PUMP ROOM	2	B	M	0.95	0.95	0.95	0.86	0.7	0.9	0.9	0.57	0.3	0.9	0.9	0.24	0.95	0.95	0.8	0.72	0.09
02-45-0-Q	QF	FAN ROOM	2	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.3	0.9	0.9	0.24	0.9	0.9	0.95	0.77	0.06
1-117-1-Q	QF	FAN ROOM	1	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.9	0.9	0.95	0.77	0.02
1-207-2-Q	QF	FAN ROOM	1	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.9	0.9	0.95	0.77	0.02
1-43-2-Q	QF	FAN ROOM	1	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.9	0.9	0.95	0.77	0.02
2-207-1-Q	QF	FAN ROOM	1	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.9	0.9	0.95	0.77	0.02
1-129-2-Q	QG	SCULLERY	1	A	S	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	1	1	0.95	0.95	0.04
1-141-2-Q	QG	GALLEY	1	B	M	0.8	0.9	0.95	0.68	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.95	0.95	0.8	0.72	0.03
1-186-3-Q	QG	TRASH COMPACTOR SPACE	1	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	1	1	0.8	0.8	0.05
01-117-0-Q	QH	HELICOPTER HANGAR																				
1-47-1-Q	QL	LAUNDRY	2	A	M	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	0.3	1	1	0.3	1	1	0.8	0.8	0.11
01-61-1-Q	QO	CO OFFICE	10	A	M	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.32
1-73-1-Q	QO	ENGINEERS OFFICE	1	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	0.9	1	0.08	1	1	0.8	0.8	0.04

Table B.6.2.1 Detailed Spreadsheet for M-Values in Port Calculations

Plan ID	CUI	Compartment Name	FRI	Class	Size	dmn	nmn	smn	Mn	fmp	vmp	pmp	Mp	sma	ama	dma	Ma	qme	cme	bme	Me	M|EB
1-82-3-Q	QO	SHIP AND SUPPLY OFFICE	1	A	M	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	0.1	0.9	1	0.09	1	1	0.8	0.8	0.03
01-103-0-Q	QS	AVIONICS SHOP	∞	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.28
1-12-0-Q	QS	ANCHOR WINDLASS RM AND BOS	∞	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.28
2-40-1-Q	QS	ORDNANCE WORKSHOP	∞	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.56
1-82-4-Q	QS	ENGINEERS WORKSHOP	∞	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.28
1-90-2-Q	QS	ELECTRICIANS WORKSHOP	∞	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.28
3-152-2-E	QS	ENGINEERS WORK SPACE	∞	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.33
01-103-1-Q	TH	MACHINERY VENT PLENUM COMP	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-103-2-Q	TH	MACHINERY VENT PLENUM COMP	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-55-1-T	TH	VENT SHAFT	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
02-55-1-T	TH	VENT SHAFT	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
1-55-1-T	TH	VENT SHAFT	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	0.9	0.9	0.95	0.77	0.27
01-63-1-T	TH	AC & WW TRUNK	∞	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	0.9	0.9	0.95	0.77	0.27
1-63-1-T	TH	AC & WW TRUNK	∞	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	0.9	0.9	0.95	0.77	0.27
2-58-1-T	TH	AC & WW TRUNK	∞	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	0.8	0.8	1	1	0.95	0.95	0.26
3-165-1-Q	TH	SERVICE ELEVATOR TRUNK	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	0.8	0.08	0.95	0.95	0.65	0.59	0.02
01-109-2-Q	TU	UPTAKE	1	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.1	1	0.8	0.08	0.95	0.95	0.65	0.59	0.02
01-110-1-Q	TU	UPTAKE	1	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.1	1	0.8	0.08	0.95	0.95	0.65	0.59	0.02
1-109-2-Q	TU	UPTAKE	1	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.1	1	0.8	0.08	0.95	0.95	0.65	0.59	0.02
1-110-1-Q	TU	UPTAKE	2	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.3	1	0.8	0.24	0.95	0.95	0.65	0.59	0.06
02-106-1-Q	TU	STACK	2	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.3	1	0.8	0.24	0.95	0.95	0.65	0.59	0.06
02-106-2-Q	TU	STACK	2	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.3	1	0.8	0.24	0.95	0.95	0.65	0.59	0.06
01-61-1-V	V	VOID	∞	A	S	0.5	0.9	0.95	0.43	1	1	1	1	1	1	1	1	1	1	0.95	0.95	0.41
1-61-1-V	V	VOID	∞	A	S	0.5	0.9	0.95	0.43	1	1	1	1	1	1	1	1	1	1	0.95	0.95	0.41
3-77-0-W	W	WATER TANK	∞	A	S	0.5	0.9	0.95	0.43	1	1	1	1	1	1	1	1	1	1	0.95	0.95	0.41

Mn=dmn*nmn*smn where dmn=detection of fire, nmn=notification of Bridge, and smn=sound the alarm
Mp=fmp*vmp*cmp where fmp=secure the fuel supply, vmp=secure the ventilation, and cmp=secure the electrical power
Ma=sma*ama*dma where sma=firefighters respond to scene of fire, ama=firefighters access compartment, and dma=agent discharges on the fire
Me=qme*cme*bme where qme=quantity of agent is adequate, cme=concentration of agent is adequate, and bme=blackout occurs
M|EB=Mn*Mp*Ma*Me where Mn=Notification, Mp=Preparation, Ma=Agent Application, and Me=Fire Extinguishment

Manual Suppression Systems:
AFFF Hose Reels, Seawater Hose Lines, Portable CO2 and PKP Extinguishers

Notes:
The columns labeled "FRI", Class", and "Size" describe the assumed fire scenario as follows:
FRI: The elapsed time for the compartment from EB to FRI
Class: The most likely class of fire that will occur
Size: The expected size of the fire (small, medium or large) upon arrival of the fire party

Table B.6.3 Probability of Flame Termination: Manual Measures (At Sea)

Plan ID	Compartment Name	M Values		
		EB	TBAR	DBAR
CUI=AG	(Gear Locker) Frequency of EB=0.0010			
1-56-1-Q	LOCKER	6	7	3
1-62-2-Q	SEABAG LKR	3	3	1
1-65-2-Q	FOUL WEATHER AND LIFE VEST LKR	10	12	6
1-95-1-Q	LIFE JACKET LOCKER	3	3	1
1-117-3-Q	RECREATION LKR	4	4	2
1-201-1-Q	LIFE JACKET LCKR	3	3	1
1-205-1-Q	FOUL WEATHER LIFE VEST LKR	3	3	1
2-80-1-Q	CG LKR	3	3	1
2-165-1-Q	SEABAG LKR	3	3	1
2-186-2-Q	SEA BAG LKR	3	3	1
CUI=AR	(Refrigerated Storage) Frequency of EB=0.0009			
3-175-0-A	REFRIGERATED STORES	20	24	16
CUI=AS	(Storeroom) Frequency of EB=0.0009			
1-53-1-Q	MOVIE LKR	46	92	46
1-58-1-L	CREWS LOCKER SPACE	13	26	13
1-103-3-A	ELECTRONIC STORES	28	56	28
1-103-4-A	ENGINEERS TOOL RM	27	54	27
1-121-2-Q	SHIP STORES	3	6	3
1-169-1-L	MEDICAL STORES	25	50	25
1-186-0-A	ENGINEERS STORES	28	56	28
02-106-0-Q	ELEC EQPT SPACE AND STRM	50	100	50
3-26A-0-A	STORES	12	24	12
3-169-2-A	STOREROOM	25	50	25
2-26A-0-A	STOREROOMS	12	24	12
2-17-0-A	BOSUN STORES	15	30	15
2-59-4-L	CREWS LOCKER SPACE	21	42	21
2-64-1-L	CREWS LOCKER SPACE	42	84	42
2-175-0-L	CREW LOCKER SPACE	13	26	13
2-194-0-L	CREW LOCKER SPACE	13	26	13
2-207A-0-A	STORAGE AREA	21	42	21
CUI=C	(Ship Control/Communications) Frequency of EB=0.0012			
1-26-1-C	GUN CONTROL BOOTH	16	17	9
02-63-0-Q	SENSOR ROOM AND COMMAND SUPPORT CENTER	29	31	17
02-48-0-C	PILOTHOUSE	42	46	25
3-47-0-C	COMMUNICATIONS CENTER	31	34	18
2-47-1-C	IC ROOM	20	22	12
3-152-0-E	ENGINEERING CONTROL CENTER	43	47	25
CUI=EM	(Main Propulsion - Mechanical) Frequency of EB=0.0272			
3-103-0-E	ENGINE ROOM	10	13	6
3-152A-0-E	ENGINE ROOM EXT	6	7	3
CUI=K	(Hazardous Material Storage) Frequency of EB=0.0013			
1-5-0-K	FLAMMABLE LIQ. STOREROOM	4	4	2
CUI=L1	(Senior Officer's Cabin) Frequency of EB=0.0008			
01-47-2-L	XO STATEROOM	40	52	24

Plan ID	Compartment Name	M Values		
		EB	TBAR	DBAR
01-47-5-L	CO STATEROOM	42	54	25
01-58-2-L	EO STATEROOM	40	52	24
01-68-3-L	WARDROOM STATEROOM	42	54	25
01-82-1-L	PASSENGER STATEROOM	42	54	25
CUI=L2	(Officer/CPO Quarters) Frequency of EB=0.0008			
1-165-2-L	CPO STATEROOM	13	20	9
1-165-4-L	CPO STATEROOM	4	6	2
1-177-0-L	CPO STATEROOM	13	20	9
1-199-0-L	CPO STATEROOM	4	6	2
1-199-2-L	CPO STATEROOM	4	6	2
01-68-4-L	WARDROOM STATEROOM	38	60	26
01-84-2-L	WARDROOM STATEROOM	38	60	26
01-85-0-L	WARDROOM STATEROOM	40	64	28
CUI=L5	(Crews Berthing) Frequency of EB=0.0008			
1-61-2-L	CREWS BERTHING	40	80	36
2-47-0-L	CREWS BERTHING	40	80	36
2-66-1-L	CREWS BERTHING	42	84	37
2-165-3-L	CREW BERTHING AREA	42	84	37
2-186-4-L	CREW BERTHING	30	60	27
CUI=LL	(Wardroom/Mess/Lounge Areas) Frequency of EB=0.0008			
1-117-0-L	CREW MESS	33	41	19
1-117-2-L	WARDROOM	28	35	16
1-165-3-L	CPO LOUNGE	45	56	27
2-72-2-L	CREWS LOUNGE	5	6	3
2-165-2-L	CREWS LOUNGE	15	18	9
2-186-1-L	CREW LOUNGE	25	31	15
CUI=LM	(Medical/Dental Spaces) Frequency of EB=0.0004			
1-179-1-L	DISPENSARY	15	18	9
CUI=LP	(Passageway/Staircase/Vestibule) Frequency of EB=0.0001			
1-26-2-L	PASSAGEWAY	39	42	35
1-47-0-L	PASSAGEWAY	56	61	50
1-62-2-L	STAIRWAY	56	61	50
1-63-0-L	PASASGEWAY	56	61	50
1-82-1-L	PASSAGEWAY	66	72	59
1-95-1-L	STAIRWAY	66	72	59
1-96-1-L	PASSAGEWAY	66	72	59
1-103-1-L	PASSAGEWAY	66	72	59
1-103-2-L	VESTIBULE	66	72	59
1-113-2-L	PASSAGEWAY	66	72	59
1-165-0-L	PASSAGEWAY	56	61	50
1-186-0-L	PASSAGEWAY	56	61	50
1-207-1-L	VESTIBULE	56	61	50
01-63A-2-L	STAIRWAY	56	61	50
01-47-1-L	VESTIBULE	33	36	29
01-52-0-L	PASSAGEWAY	56	61	50
01-68-0-L	PASSAGEWAY	56	61	50
01-98-0-L	PASSAGEWAY	39	42	35

Plan ID	Compartment Name	M Values		
		EB	TBAR	DBAR
02-65A-4-L	STAIRWAY	33	36	29
02-63-2-L	PASSAGEWAY	39	42	35
02-65-2-L	STAIRWAY	39	42	35
3-62-2-L	STAIRWAY	7	7	6
3-94-1-L	STAIRWAY	5	5	4
2-56-0-L	PASSAGEWAY	56	61	50
2-64-2-L	STAIRWAY	6	6	5
2-95-1-L	STAIRWAY	7	7	6
2-178-1-L	STAIRWAY	56	61	50
2-199-1-L	STAIRWAY	56	61	50
2-210-1-L	STAIRWAY	43	47	38
CUI=LW	(Sanitary Spaces) Frequency of EB=0.0002			
1-51-2-L	SANITARY SPACE	46	50	41
1-174-2-L	SANITARY SPACE	43	47	38
1-186-4-L	SANITARY SPACE	39	42	35
01-47-3-L	SANITARY SPACE	33	36	29
01-47-4-L	SANITARY SPACE	33	36	29
01-68-2-L	SANITARY SPACE	39	42	35
01-81-1-L	SANITARY SPACE	39	42	35
01-89-2-L	SANITARY SPACE	39	42	35
01-94-2-L	DECONTAMINATION SHOWER	33	36	29
02-72-2-L	SANITARY SPACE	39	42	35
2-58-1-L	SANITARY SPACE	46	50	41
2-59-2-L	SANITARY SPACE	46	50	41
2-75-0-L	SANITARY SPACE	46	50	41
3-160-2-L	SANITARY SPACE	39	42	35
2-165-0-L	SANITARY SPACE	46	50	41
2-186-0-L	SANITARY SPACE	46	50	41
CUI=QA	(Aux Machinery Spaces) Frequency of EB=0.0029			
1-186-2-Q	COMPUTER ROOM	3	3	2
1-207-3-J	JP-5 FUELING	1	1	0
01-94-1-Q	WINCH MACH. SPACE	2	2	1
3-82-0-E	AUXILIARY MACHINE SPACE NO. 2	6	6	4
4-186-0-J	JP-5 PUMP ROOM	9	9	6
2-82-0-E	AMS NO 1	10	11	7
3-228-0-E	STEERING GEAR ROOM	11	12	8
CUI=QF	(Fan Room) Frequency of EB=0.0004			
1-43-2-Q	FAN ROOM	2	5	1
1-117-1-Q	FAN ROOM	2	5	1
1-207-2-Q	FAN ROOM	2	5	1
02-45-0-Q	FAN SPACE	6	15	4
2-207-1-Q	FAN ROOM	2	5	1
CUI=QG	(Galley/Pantry/Scullery) Frequency of EB=0.0026			
1-129-2-Q	SCULLERY	4	5	3
1-141-2-Q	GALLEY	3	4	2
1-186-3-Q	TRASH COMPACTOR SPACE	5	7	4
CUI=QL	(Laundry) Frequency of EB=0.0031			

Plan ID	Compartment Name	M Values		
		EB	TBAR	DBAR
1-47-1-Q	LAUNDRY	11	16	6
CUI=QO	(Office Spaces) Frequency of EB=0.0004			
1-73-1-Q	ENGINEERS OFFICE	4	5	2
1-82-3-Q	SHIP AND SUPPLY OFFICE	3	3	1
01-61-1-Q	CO OFFICE	40	50	24
CUI=QS	(Shops) Frequency of EB=0.0018			
1-12-0-Q	ANCHOR WINDLASS RM AND BOSUN'S WORKSHOP	28	33	16
1-82-2-Q	FORWARD REPAIR #2	30	36	18
1-82-4-Q	ENGINEERS WORKSHOP	36	43	21
1-90-2-Q	ELCTRICIANS WORKSHOP	36	43	21
01-103-0-Q	AVIONICS SHOP	36	43	21
2-40-1-Q	ORDNANCE WORKSHOP	56	67	33
3-152-2-E	ENGINEERS WORK SPACE	39	46	23
2-221-1-Q	AFT REPAIR #3	30	36	18
CUI=TH	(Trunks/Hoists/Dumbwaiters) Frequency of EB=0.0001			
1-55-1	VENT SHAFT	33	39	19
1-63-1	AC&WW TRUNK	33	39	19
3-165-1-Q	SERVICE ELEVATOR TRUNK	33	39	19
01-55-1	VENT SHAFT	33	39	19
01-63-1	AC & WW TRUNK	27	32	16
01-103-1-Q	MACHINERY VENT PLENUM COMPT	33	39	19
01-103-2-Q	MACHINERY VENT PLENUM COMPT	33	39	19
02-55-1	VENT SHAFT	33	39	19
2-58-1	WW & AC TRUNK	27	32	16
CUI=TU	(Stacks/Engine Uptakes) Frequency of EB=0.0013			
1-109-2	UPTAKE	2	2	1
1-110-1	UPTAKE	6	7	3
01-109-2	UPTAKE	2	2	1
01-110-1	UPTAKE	2	2	1
02-106-1-Q	STACK	6	7	3
02-106-2-Q	STACK	6	7	3
CUI=V	(Voids/Cofferdams) Frequency of EB=0.0001			
1-61-1	VOID	41	41	41
01-61-1	VOID	41	41	41
CUI=W	(Water Tank (empty)) Frequency of EB=0.0004			
3-77-0-W	WATER	41	41	41

Table B.6.3.1 Detailed Spreadsheet for M-Values At Sea Calculations

Plan ID	CUI	Compartment Name	FRI	Class	Size	dmn	nmn	smn	Mn	fmp	vmp	pmp	Mp	sma	ama	dma	Ma	qme	cme	bme	Me	M	EB
1-117-3-Q	AG	RECREATION LOCKER	1	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.04	
1-201-1-Q	AG	LIFE JACKET LOCKER	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03	
1-95-1-Q	AG	LIFE JACKET LOCKER	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03	
02-96-0-M	AG	SMALL ARMS LOCKER	5	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.9	0.9	1	0.81	1	1	0.95	0.95	0.27	
2-186-2-Q	AG	SEA BAG LOCKER	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03	
1-62-2-Q	AG	SEA BAG LOCKER	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03	
1-65-2-Q	AG	FOUL WEATHER & LIFE VEST LKR	2	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.3	1	1	0.3	1	1	0.95	0.95	0.10	
1-205-1-Q	AG	FOUL WEATHER & LIFE VEST LKR	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03	
1-53-1-Q	AG	MOVIE LOCKER	∞	A	S	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.46	
1-56-1-Q	AG	CG LOCKER	1	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.08	
2-80-1-Q	AG	CG LOCKER	1	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.03	
3-175-0-A	AR	REFRIGERATED STORES	5	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.9	0.9	0.9	0.73	1	1	0.8	0.8	0.20	
1-82-2-Q	AS	FORWARD REPAIR #2	38	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.30	
2-221-1-Q	AS	AFT REPAIR #3	∞	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.30	
1-121-2-Q	AS	SHIP STORE	1	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.1	0.9	1	0.09	1	1	0.8	0.8	0.03	
1-103-4-A	AS	ENGINEERS TOOL RM	5	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.9	0.9	1	0.81	1	1	0.8	0.8	0.27	
02-106-0-Q	AS	ELEC EQPT SPACE AND STRM	∞	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.50	
1-186-0-A	AS	ENGINEERS STORES	6	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.95	0.9	1	0.86	1	1	0.8	0.8	0.28	
1-103-3-A	AS	ELECTRONIC STORES	8	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.95	0.9	1	0.86	1	1	0.8	0.8	0.28	
2-17-0-A	AS	BOSUN STORES	2	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.15	
1-169-1-L	AS	MEDICAL STORES	12	A	M	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.25	
2-26A-0-A	AS	STOREROOMS	2	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.3	0.9	0.8	0.22	1	1	0.8	0.8	0.12	
3-26A-0-A	AS	STOREROOMS	2	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.3	0.9	0.8	0.22	1	1	0.8	0.8	0.12	
2-207A-0-A	AS	STOREROOM	4	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.7	0.9	1	0.63	1	1	0.8	0.8	0.21	
3-169-2-A	AS	STOREROOM	3	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.5	0.9	1	0.45	1	1	0.8	0.8	0.25	
1-58-1-L	AS	CREWS LOCKER SPACE	2	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.13	
2-175-0-L	AS	CREWS LOCKER SPACE	2	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.13	
2-194-0-L	AS	CREWS LOCKER SPACE	2	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.13	
2-59-4-L	AS	CREWS LOCKER SPACE	3	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.5	0.9	1	0.45	1	1	0.8	0.8	0.21	
2-64-1-L	AS	CREWS LOCKER SPACE	23	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.42	
02-48-0-C	C	PILOTHOUSE	6	C	M	1	1	1	1	1	0.9	0.9	0.81	0.95	1	0.85	0.81	0.9	0.9	0.8	0.65	0.42	
02-63-0-Q	C	SENSOR ROOM AND COMMAND S	10	C	M	0.95	0.9	0.95	0.81	1	0.9	0.9	0.81	1	0.8	0.85	0.68	0.9	0.9	0.8	0.65	0.29	
1-26-1-C	C	GUN CONTROL BOOTH	3	A	M	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	0.5	0.9	1	0.45	1	1	0.8	0.8	0.16	
2-47-1-C	C	IC ROOM	4	C	M	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	0.7	1	1	0.7	0.9	0.9	0.8	0.65	0.20	
3-152-0-E	C	ENGINEERING CONTROL CENTER	7	C	M	1	0.9	0.95	0.86	1	0.9	0.9	0.81	0.95	1	1	0.95	0.9	0.9	0.8	0.65	0.43	
3-47-0-C	C	COMMUNICATIONS CENTER	7	C	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.95	0.8	0.9	0.68	0.9	0.9	0.8	0.65	0.31	
3-103-0-E	EM	ENGINE ROOM	3	B	L	0.95	0.95	0.95	0.86	0.8	0.8	0.8	0.51	0.5	1	0.8	0.4	0.95	0.95	0.65	0.59	0.10	
3-152A-0-E	EM	ENGINE ROOM EXT	2	B	L	0.95	0.95	0.95	0.86	0.8	0.8	0.8	0.51	0.3	1	0.8	0.24	0.95	0.95	0.65	0.59	0.06	
4-165-4-F	F	DIESEL OIL TANK																					
4-65-1-F	F	FUEL TANK																					
4-190-0-J	J	FUEL STORAGE AREA																					
1-5-0-K	K	FLAMMABLE LIQ. STOREROOM	1	B	L	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.1	0.9	1	0.09	0.95	0.95	0.65	0.59	0.04	
01-47-2-L	L1	XO STATEROOM	7	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	0.9	1	0.86	1	1	0.8	0.8	0.40	
01-47-5-L	L1	CO STATEROOM	10	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.42	

Table B.6.3.1 Detailed Spreadsheet for M-Values At Sea Calculations

Plan ID	CUI	Compartment Name	FRI	Class	Size	dmn	nmn	smn	Mn	fmp	vmp	pmp	Mp	sma	ama	dma	Ma	qme	cme	bme	Me	MEB
01-58-2-L	L1	EO STATEROOM	6	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	0.9	1	0.86	1	1	0.8	0.8	0.40
01-68-3-L	L1	WARDROOM STATEROOM	11	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.42
01-82-1-L	L1	PASSENGER STATEROOM	12	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.42
01-68-4-L	L2	WARDROOM STATEROOM	5	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.9	0.9	1	0.81	1	1	0.8	0.8	0.38
01-84-2-L	L2	WARDROOM STATEROOM	5	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.9	0.9	1	0.81	1	1	0.8	0.8	0.38
01-85-0-L	L2	WARDROOM STATEROOM	6	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	0.9	1	0.86	1	1	0.8	0.8	0.40
1-165-2-L	L2	CPO STATEROOM	2	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.13
1-165-4-L	L2	CPO STATEROOM	1	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	0.9	1	0.09	1	1	0.8	0.8	0.04
1-177-0-L	L2	CPO STATEROOM	2	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	0.9	1	0.27	1	1	0.8	0.8	0.13
1-199-0-L	L2	CPO STATEROOM	1	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	0.9	1	0.09	1	1	0.8	0.8	0.04
1-199-2-L	L2	CPO STATEROOM	1	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	0.9	1	0.09	1	1	0.8	0.8	0.04
1-61-2-L	L5	CREWS BERTHING	7	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	1	0.9	0.86	1	1	0.8	0.8	0.40
2-165-3-L	L5	CREWS BERTHING	10	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	0.9	0.9	1	1	0.8	0.8	0.42
2-186-4-L	L5	CREWS BERTHING	4	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.7	1	0.9	0.63	1	1	0.8	0.8	0.30
2-47-0-L	L5	CREWS BERTHING	7	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	1	0.9	0.86	1	1	0.8	0.8	0.40
2-66-1-L	L5	CREWS BERTHING	10	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	0.9	0.9	1	1	0.8	0.8	0.42
1-117-0-L	LL	CREWS MESS	7	A	M	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	0.95	1	0.9	0.86	1	1	0.8	0.8	0.33
1-117-2-L	LL	WARDROOM	7	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.95	1	0.9	0.86	1	1	0.8	0.8	0.28
1-165-3-L	LL	CPO LOUNGE	8	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.95	1	1	0.95	1	1	0.8	0.8	0.45
2-165-2-L	LL	CREWS LOUNGE	2	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.3	1	0.9	0.27	1	1	0.95	0.95	0.15
2-186-1-L	LL	CREWS LOUNGE	3	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.5	1	0.9	0.45	1	1	0.95	0.95	0.25
2-72-2-L	LL	CREWS LOUNGE	1	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	1	0.9	0.09	1	1	0.95	0.95	0.05
1-179-1-L	LM	DISPENSARY	3	A	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.5	0.9	1	0.45	1	1	0.8	0.8	0.15
01-47-1-L	LP	VESTIBULE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
1-103-2-L	LP	VESTIBULE	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
1-207-1-L	LP	VESTIBULE	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
01-63A-2-L	LP	STAIRWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
02-65-2-L	LP	STAIRWAY	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
02-65A-4-L	LP	STAIRWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
1-62-2-L	LP	STAIRWAY	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
1-95-1-L	LP	STAIRWAY	13	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
2-178-1-L	LP	STAIRWAY	8	A	S	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.43
2-210-1-L	LP	STAIRWAY	1	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.08
2-64-2-L	LP	STAIRWAY	1	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.07
2-95-1-L	LP	STAIRWAY	1	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.07
3-62-2-L	LP	STAIRWAY	1	A	S	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	0.1	1	1	0.1	1	1	0.95	0.95	0.05
3-94-1-L	LP	STAIRWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
01-52-0-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
01-68-0-L	LP	PASSAGEWAY	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
01-98-0-L	LP	PASSAGEWAY	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
02-63-2-L	LP	PASSAGEWAY	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
1-103-1-L	LP	PASSAGEWAY	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
1-113-2-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
1-165-0-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56

Table B.6.3.1 Detailed Spreadsheet for M-Values At Sea Calculations

Plan ID	CUI	Compartment Name	FRI	Class	Size	dmn	nmn	smn	Mn	fmp	vmp	pmp	Mp	sma	ama	dma	Ma	qme	cme	bme	Me	M EB
1-186-0-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
1-26-2-L	LP	PASSAGEWAY	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
1-47-0-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
1-63-0-L	LP	PASASGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
1-82-1-L	LP	PASSAGEWAY	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
1-96-1-L	LP	PASSAGEWAY	8	A	S	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.66
2-56-0-L	LP	PASSAGEWAY	8	A	S	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.56
01-47-3-L	LW	SANITARY SPACE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-47-4-L	LW	SANITARY SPACE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-68-2-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
01-81-1-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
01-89-2-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
02-72-2-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
1-174-2-L	LW	SANITARY SPACE	8	A	S	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.43
1-186-4-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
1-51-2-L	LW	SANITARY SPACE	8	A	S	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.46
2-165-0-L	LW	SANITARY SPACE	8	A	S	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.46
2-186-0-L	LW	SANITARY SPACE	8	A	S	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.46
2-58-1-L	LW	SANITARY SPACE	8	A	S	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.46
2-59-2-L	LW	SANITARY SPACE	8	A	S	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.46
2-75-0-L	LW	SANITARY SPACE	8	A	S	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.39
3-160-2-L	LW	SANITARY SPACE	8	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-94-2-L	LW	DECONTAMINATION SHOWER																				
1-26-0-M	M	MAGAZINE																				
2-214-2-M	M	SMALL ARMS MAGAZINE																				
01-94-1-Q	QA	WINCH MACHINERY ROOM	1	B	M	0.6	0.9	0.95	0.51	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.95	0.95	0.8	0.72	0.02
1-186-2-Q	QA	COMPUTER ROOM	1	C	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.9	0.9	0.8	0.65	0.03
3-228-0-E	QA	STEERING GEAR ROOM	2	B	M	0.95	0.95	0.95	0.86	0.9	0.9	0.9	0.73	0.3	0.9	0.9	0.24	0.95	0.95	0.8	0.72	0.11
2-82-0-E	QA	AUX MACHINERY SPACE #1	2	C	M	0.95	0.95	0.95	0.86	0.9	0.9	0.9	0.73	0.3	0.9	0.9	0.24	0.9	0.9	0.8	0.65	0.10
3-82-0-E	QA	AUX MACHINERY SPACE #2	2	C	M	0.7	0.9	0.95	0.6	0.9	0.9	0.9	0.73	0.3	0.9	0.9	0.24	0.9	0.9	0.8	0.65	0.07
1-207-3-J	QA	JP-5 FUELING	1	B	M	0.5	0.9	0.95	0.43	0.7	0.9	0.9	0.57	0.1	0.9	0.9	0.08	0.95	0.95	0.8	0.72	0.01
4-186-0-J	QA	JP-5 PUMP ROOM	2	B	M	0.95	0.95	0.95	0.86	0.7	0.9	0.9	0.57	0.3	0.9	0.9	0.24	0.95	0.95	0.8	0.72	0.09
02-45-0-Q	QF	FAN ROOM	2	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.3	0.9	0.9	0.24	0.9	0.9	0.95	0.77	0.06
1-117-1-Q	QF	FAN ROOM	1	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.9	0.9	0.95	0.77	0.02
1-207-2-Q	QF	FAN ROOM	1	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.9	0.9	0.95	0.77	0.02
1-43-2-Q	QF	FAN ROOM	1	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.9	0.9	0.95	0.77	0.02
2-207-1-Q	QF	FAN ROOM	1	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.9	0.9	0.95	0.77	0.02
1-129-2-Q	QG	SCULLERY	1	A	S	0.8	0.9	0.95	0.68	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	1	1	0.95	0.95	0.04
1-141-2-Q	QG	GALLEY	1	B	M	0.8	0.9	0.95	0.68	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	0.95	0.95	0.8	0.72	0.03
1-186-3-Q	QG	TRASH COMPACTOR SPACE	1	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	0.1	0.9	0.9	0.08	1	1	0.8	0.8	0.05
01-117-0-Q	QH	HELICOPTER HANGAR																				
1-47-1-Q	QL	LAUNDRY	2	A	M	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	0.3	1	1	0.3	1	1	0.8	0.8	0.11
01-61-1-Q	QO	CO OFFICE	10	A	M	0.8	0.9	0.95	0.68	1	0.9	0.9	0.81	1	0.9	1	0.9	1	1	0.8	0.8	0.40
1-73-1-Q	QO	ENGINEERS OFFICE	1	A	M	0.85	0.9	0.95	0.73	1	0.9	0.9	0.81	0.1	0.9	1	0.09	1	1	0.8	0.8	0.04

Table B.6.3.1 Detailed Spreadsheet for M-Values At Sea Calculations

Plan ID	CUI	Compartment Name	FRI	Class	Size	dmn	nmn	smn	Mn	fmp	vmp	pmp	Mp	sma	ama	dma	Ma	qme	cme	bme	Me	M|EB
1-82-3-Q	QO	SHIP AND SUPPLY OFFICE	1	A	M	0.8	0.9	0.95	0.68	1	0.9	0.9	0.81	0.1	0.9	1	0.09	1	1	0.8	0.8	0.04
01-103-0-Q	QS	AVIONICS SHOP	∞	A	M	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.36
1-12-0-Q	QS	ANCHOR WINDLASS RM AND BOS	∞	A	M	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.36
2-40-1-Q	QS	ORDNANCE WORKSHOP	∞	A	M	0.95	0.95	0.95	0.86	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.56
1-82-4-Q	QS	ENGINEERS WORKSHOP	∞	A	M	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.36
1-90-2-Q	QS	ELECTRICIANS WORKSHOP	∞	A	M	0.65	0.9	0.95	0.56	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.36
3-152-2-E	QS	ENGINEERS WORK SPACE	∞	A	M	0.7	0.9	0.95	0.6	1	0.9	0.9	0.81	1	1	1	1	1	1	0.8	0.8	0.39
01-103-1-Q	TH	MACHINERY VENT PLENUM COMP	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-103-2-Q	TH	MACHINERY VENT PLENUM COMP	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-55-1-T	TH	VENT SHAFT	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
02-55-1-T	TH	VENT SHAFT	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
1-55-1-T	TH	VENT SHAFT	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	1	1	0.95	0.95	0.33
01-63-1-T	TH	AC & WW TRUNK	∞	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	0.9	0.9	0.95	0.77	0.27
1-63-1-T	TH	AC & WW TRUNK	∞	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	0.9	0.9	0.95	0.77	0.27
2-58-1-T	TH	AC & WW TRUNK	∞	C	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	1	1	0.9	0.9	0.95	0.77	0.27
3-165-1-Q	TH	SERVICE ELEVATOR TRUNK	∞	A	S	0.5	0.9	0.95	0.43	1	0.9	0.9	0.81	1	1	0.8	0.8	1	1	0.95	0.95	0.26
01-109-2-Q	TU	UPTAKE	1	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.1	1	0.8	0.08	0.95	0.95	0.65	0.59	0.02
01-110-1-Q	TU	UPTAKE	1	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.1	1	0.8	0.08	0.95	0.95	0.65	0.59	0.02
1-109-2-Q	TU	UPTAKE	1	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.1	1	0.8	0.08	0.95	0.95	0.65	0.59	0.02
1-110-1-Q	TU	UPTAKE	2	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.3	1	0.8	0.24	0.95	0.95	0.65	0.59	0.06
02-106-1-Q	TU	STACK	2	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.3	1	0.8	0.24	0.95	0.95	0.65	0.59	0.06
02-106-2-Q	TU	STACK	2	B	L	0.7	0.9	0.95	0.6	1	0.8	0.9	0.72	0.3	1	0.8	0.24	0.95	0.95	0.65	0.59	0.06
01-61-1-V	V	VOID	∞	A	S	0.5	0.9	0.95	0.43	1	1	1	1	1	1	1	1	1	1	0.95	0.95	0.41
1-61-1-V	V	VOID	∞	A	S	0.5	0.9	0.95	0.43	1	1	1	1	1	1	1	1	1	1	0.95	0.95	0.41
3-77-0-W	W	WATER TANK	∞	A	S	0.5	0.9	0.95	0.43	1	1	1	1	1	1	1	1	1	1	0.95	0.95	0.41

Mn=dmn*nmn*smn where dmn=detection of fire, nmn=notification of Bridge, and smn=sound the alarm
Mp=fmp*vmp*cmp where fmp=secure the fuel supply, vmp=secure the ventilation, and cmp=secure the electrical power
Ma=sma*ama*dma where sma=firefighters respond to scene of fire, ama=firefighters access compartment, and dma=agent discharges on the fire
Me=qme*cme*bme where qme=quantity of agent is adequate, cme=concentration of agent is adequate, and bme=blackout occurs
M|EB=Mn*Mp*Ma*Me where Mn=Notification, Mp=Preparation, Ma=Agent Application, and Me=Fire Extinguishment

Manual Suppression Systems:
AFFF Hose Reels, Seawater Hose Lines, Portable CO2 and PKP Extinguishers

Notes:
The columns labeled "FRI", Class", and "Size" describe the assumed fire scenario as follows:
FRI: The elapsed time for the compartment from EB to FRI
Class: The most likely class of fire that will occur
Size: The expected size of the fire (small, medium or large) upon arrival of the fire party

Table B.7 Fuel Loads

Plan ID	Compartment Name	Cell (psf)	Plas (psf)	Flm Liq (Gals.)	Total (kBTUs/sf)	Growth Model	Stack Ht. %	% Deck Occupied
CUI=AG	(Gear Locker)							
1-56-1-Q	LOCKER	17	7	1	42	12	NA	90
1-62-2-Q	SEABAG LKR	448	134	0	255.7	12	NA	90
1-65-2-Q	FOUL WEATHER AND LIFE VEST LKR	100	100	0	110.4	12	NA	90
1-95-1-Q	LIFE JACKET LOCKER	200	25	0	139	12	NA	90
1-117-3-Q	RECREATION LKR	150	100	0	74.8	12	NA	90
1-201-1-Q	LIFE JACKET LCKR	200	25	0	109.8	12	NA	90
1-205-1-Q	FOUL WEATHER LIFE VEST LKR	100	100	0	370.3	12	NA	90
2-80-1-Q	CG LKR	114	34	0	254.5	12	NA	90
2-165-1-Q	SEABAG LKR	281	84	0	255.2	12	NA	90
2-186-2-Q	SEA BAG LKR	348	104	0	255.7	12	NA	90
CUI=AR	(Refrigerated Storage)							
3-175-0-A	REFRIGERATED STORES	70	70	0	11.8	4	NA	75
CUI=AS	(Storeroom)							
1-53-1-Q	MOVIE LKR	17	7	1	42	5	NA	90
1-58-1-L	CREWS LOCKER SPACE	1477	221	1	104.9	5	NA	90
1-103-3-A	ELECTRONIC STORES	676	101	0	103.8	5	NA	90
1-103-4-A	ENGINEERS TOOL RM	703	105	0	103.8	5	NA	90
1-121-2-Q	SHIP STORES	336	89	0	91.8	5	NA	90
1-169-1-L	MEDICAL STORES	218	32	0	103	5	NA	90
1-186-0-A	ENGINEERS STORES	588	88	0	103.8	5	NA	90
02-106-0-Q	ELEC EQPT SPACE AND STRM	336	268	0	41.6	5	NA	90
3-26A-0-A	STORES	2000	300	0	78.2	5	NA	90
3-169-2-A	STOREROOM	2000	1000	0	72.2	5	NA	90
2-26A-0-A	STOREROOMS	3500	750	0	120.4	5	NA	90
2-17-0-A	BOSUN STORES	1000	1000	0	226.8	5	NA	90
2-59-4-L	CREWS LOCKER SPACE	300	100	0	53.7	5	NA	90
2-64-1-L	CREWS LOCKER SPACE	100	30	0	18.5	5	NA	90
2-175-0-L	CREW LOCKER SPACE	1000	250	0	59.1	5	NA	90
2-194-0-L	CREW LOCKER SPACE	1000	250	0	52.9	5	NA	90
2-207A-0-A	STORAGE AREA	500	100	0	10.6	5	NA	90
CUI=C	(Ship Control/Communications)							
1-26-1-C	GUN CONTROL BOOTH	100	25	0	37.5	7	NA	50
02-63-0-Q	SENSOR ROOM AND COMMAND SUPPORT CENTER	2000	2000	0	47	7	NA	50
02-48-0-C	PILOTHOUSE	200	100	0	10.2	7	NA	50
3-47-0-C	COMMUNICATIONS CENTER	1500	2000	0	66.6	7	NA	50
2-47-1-C	IC ROOM	200	500	0	92.2	7	NA	50
3-152-0-E	ENGINEERING CONTROL CENTER	500	400	0	26.7	7	NA	50
CUI=EM	(Main Propulsion - Mechanical)							
3-103-0-E	ENGINE ROOM	7000	7000	10	95.5	13	NA	75
3-152A-0-E	ENGINE ROOM EXT	1600	1600	5	83.9	13	NA	75
CUI=K	(Hazardous Material Storage)							
1-5-0-K	FLAMMABLE LIQ. STOREROOM	100	25	250	494	3	90	80
CUI=L1	(Senior Officer's Cabin)							
01-47-2-L	XO STATEROOM	250	75	0	32	10	NA	60
01-47-5-L	CO STATEROOM	250	75	0	27.6	10	NA	60
01-58-2-L	EO STATEROOM	250	75	0	32.9	10	NA	60
01-68-3-L	WARDROOM STATEROOM	250	75	0	24	10	NA	60
01-82-1-L	PASSENGER STATEROOM	250	75	0	22.1	10	NA	60
CUI=L2	(Officer/CPO Quarters)							
1-165-2-L	CPO STATEROOM	250	25	0	30.4	10	NA	80

Plan ID	Compartment Name	Cell	Plas	Flm Liq	Total	Growth	Stack Ht.	% Deck
		(psf)	(psf)	(Gals.)	(kBTUs/sf)	Model	%	Occupied
1-165-4-L	CPO STATEROOM	250	40	0	32.6	10	NA	80
1-177-0-L	CPO STATEROOM	250	25	0	31.7	10	NA	80
1-199-0-L	CPO STATEROOM	250	25	0	34.2	10	NA	80
1-199-2-L	CPO STATEROOM	250	25	0	34.9	10	NA	80
01-68-4-L	WARDROOM STATEROOM	250	25	0	17.6	10	NA	80
01-84-2-L	WARDROOM STATEROOM	250	25	0	17.4	10	NA	80
01-85-0-L	WARDROOM STATEROOM	250	25	0	20.7	10	NA	80
CUI=L5	(Crews Berthing)							
1-61-2-L	CREWS BERTHING	2000	300	0	83.6	10	NA	90
2-47-0-L	CREWS BERTHING	1000	250	0	71.4	10	NA	90
2-66-1-L	CREWS BERTHING	1200	200	0	88.7	10	NA	90
2-165-3-L	CREW BERTHING AREA	2300	600	0	107.8	10	NA	90
2-186-4-L	CREW BERTHING	2100	500	0	97.8	10	NA	90
CUI=LL	(Wardroom/Mess/Lounge Areas)							
1-117-0-L	CREW MESS	200	150	0	5	9	NA	50
1-117-2-L	WARDROOM	700	100	0	20.4	9	NA	50
1-165-3-L	CPO LOUNGE	300	100	0	30.1	9	NA	50
2-72-2-L	CREWS LOUNGE	100	600	0	66.7	9	NA	50
2-165-2-L	CREWS LOUNGE	100	250	0	36.7	9	NA	50
2-186-1-L	CREW LOUNGE	400	300	0	81	9	NA	50
CUI=LM	(Medical/Dental Spaces)							
1-179-1-L	DISPENSARY	658	98	1	105.8	9	NA	80
CUI=LP	(Passageway/Staircase/Vestibule)							
1-26-2-L	PASSAGEWAY	200	75	0	19.3	14	NA	20
1-47-0-L	PASSAGEWAY	75	75	0	16.1	14	NA	20
1-62-2-L	STAIRWAY	47	11	0	35.2	14	NA	20
1-63-0-L	PASASGEWAY	200	50	0	25	14	NA	20
1-82-1-L	PASSAGEWAY	5	5	0	1.2	14	NA	20
1-95-1-L	STAIRWAY	50	10	0	26.7	14	NA	20
1-96-1-L	PASSAGEWAY	100	75	0	44.6	14	NA	20
1-103-1-L	PASSAGEWAY	5	10	0	3.6	14	NA	20
1-103-2-L	VESTIBULE	5	10	0	5.6	14	NA	20
1-113-2-L	PASSAGEWAY	60	15	0	36	14	NA	20
1-165-0-L	PASSAGEWAY	100	25	0	6.6	14	NA	20
1-186-0-L	PASSAGEWAY	150	50	0	10.9	14	NA	20
1-207-1-L	VESTIBULE	20	30	0	10.2	14	NA	20
01-63A-2-L	STAIRWAY	20	30	0	30.7	14	NA	20
01-47-1-L	VESTIBULE	10	15	0	20.9	14	NA	20
01-52-0-L	PASSAGEWAY	150	100	0	20.7	14	NA	20
01-68-0-L	PASSAGEWAY	50	75	0	10.9	14	NA	20
01-98-0-L	PASSAGEWAY	100	25	0	13.4	14	NA	20
02-65A-4-L	STAIRWAY	10	5	0	23.7	14	NA	20
02-63-2-L	PASSAGEWAY	50	150	0	25	14	NA	20
02-65-2-L	STAIRWAY	10	5	0	14	14	NA	20
3-62-2-L	STAIRWAY	10	5	0	7.4	14	NA	20
3-94-1-L	STAIRWAY	10	5	0	7.1	14	NA	20
2-56-0-L	PASSAGEWAY	50	50	0	12.2	14	NA	20
2-64-2-L	STAIRWAY	10	5	0	11.4	14	NA	20
2-95-1-L	STAIRWAY	10	5	0	7.7	14	NA	20
2-178-1-L	STAIRWAY	10	5	0	10.5	14	NA	20
2-199-1-L	STAIRWAY	10	5	0	10.6	14	NA	20
2-210-1-L	STAIRWAY	10	5	0	6	14	NA	20
CUI=LW	(Sanitary Spaces)							
1-51-2-L	SANITARY SPACE	10	5	0	1.4	16	NA	20

Plan ID	Compartment Name	Cell	Plas	Flm Liq	Total	Growth	Stack Ht.	% Deck
		(psf)	(psf)	(Gals.)	(kBTUs/sf)	Model	%	Occupied
1-174-2-L	SANITARY SPACE	10	5	0	1.6	16	NA	20
1-186-4-L	SANITARY SPACE	10	5	0	2.5	16	NA	20
01-47-3-L	SANITARY SPACE	10	5	0	4.9	16	NA	20
01-47-4-L	SANITARY SPACE	10	5	0	3.5	16	NA	20
01-68-2-L	SANITARY SPACE	10	5	0	4.4	16	NA	20
01-81-1-L	SANITARY SPACE	10	5	0	8.3	16	NA	20
01-89-2-L	SANITARY SPACE	10	5	0	6.7	16	NA	20
01-94-2-L	DECONTAMINATION SHOWER	10	5	0	14.7	16	NA	20
02-72-2-L	SANITARY SPACE	10	5	0	8.3	16	NA	20
2-58-1-L	SANITARY SPACE	10	5	0	3	16	NA	20
2-59-2-L	SANITARY SPACE	10	5	0	3.2	16	NA	20
2-75-0-L	SANITARY SPACE	10	5	0	9	16	NA	20
3-160-2-L	SANITARY SPACE	10	5	0	14.5	16	NA	20
2-165-0-L	SANITARY SPACE	10	5	0	1.6	16	NA	20
2-186-0-L	SANITARY SPACE	10	5	0	1.6	16	NA	20
CUI=QA	(Aux Machinery Spaces)							
1-186-2-Q	COMPUTER ROOM	150	150	5	44.4	13	NA	75
1-207-3-J	JP-5 FUELING	120	80	0	53.7	13	NA	75
01-94-1-Q	WINCH MACH. SPACE	154	123	5	49.6	13	NA	75
3-82-0-E	AUXILIARY MACHINE SPACE NO. 2	2100	1400	5	57.2	13	NA	75
4-186-0-J	JP-5 PUMP ROOM	900	600	5	58.4	13	NA	75
2-82-0-E	AMS NO 1	2900	2200	10	81.4	13	NA	75
3-228-0-E	STEERING GEAR ROOM	600	200	5	13	13	NA	75
CUI=QF	(Fan Room)							
1-43-2-Q	FAN ROOM	75	25	0	59.5	13	NA	50
1-117-1-Q	FAN ROOM	30	0	0	3.5	13	NA	50
1-207-2-Q	FAN ROOM	25	15	0	26.2	13	NA	50
02-45-0-Q	FAN SPACE	300	50	0	7	13	NA	50
2-207-1-Q	FAN ROOM	50	20	0	19.1	13	NA	50
CUI=QG	(Galley/Pantry/Scullery)							
1-129-2-Q	SCULLERY	25	15	1	6	13	NA	40
1-141-2-Q	GALLEY	50	10	1	1.9	13	NA	40
1-186-3-Q	TRASH COMPACTOR SPACE	25	50	1	6.9	13	NA	40
CUI=QL	(Laundry)							
1-47-1-Q	LAUNDRY	150	100	10	33.1	12	NA	50
CUI=QO	(Office Spaces)							
1-73-1-Q	ENGINEERS OFFICE	500	100	0	44.7	8	NA	60
1-82-3-Q	SHIP AND SUPPLY OFFICE	550	150	0	34.8	8	NA	60
01-61-1-Q	CO OFFICE	125	35	0	22.4	8	NA	60
CUI=QS	(Shops)							
1-12-0-Q	ANCHOR WINDLASS RM AND BOSUN'S WORKSHOP	100	75	0	7.5	5	NA	50
1-82-2-Q	FORWARD REPAIR #2	250	150	0	61	5	NA	50
1-82-4-Q	ENGINEERS WORKSHOP	200	100	10	17.5	5	NA	50
1-90-2-Q	ELCTRICIANS WORKSHOP	75	25	0	23.7	5	NA	50
01-103-0-Q	AVIONICS SHOP	300	100	0	36.3	5	NA	75
2-40-1-Q	ORDNANCE WORKSHOP	100	75	5	55	5	NA	50
3-152-2-E	ENGINEERS WORK SPACE	500	400	0	158.8	5	NA	50
2-221-1-Q	AFT REPAIR #3	14	14	0	4.6	5	NA	50
CUI=TH	(Trunks/Hoists/Dumbwaiters)							
1-55-1	VENT SHAFT	20	10	0	15.4	16	NA	20
1-63-1	AC&WW TRUNK	7	3	0	14.5	16	NA	20
3-165-1-Q	SERVICE ELEVATOR TRUNK	10	15	0	16.6	16	NA	20

Plan ID	Compartment Name	Cell	Plas	Flm Liq	Total	Growth	Stack Ht.	% Deck
		(psf)	(psf)	(Gals.)	(kBTUs/sf)	Model	%	Occupied
01-55-1	VENT SHAFT	20	10	0	15.4	16	NA	20
01-63-1	AC & WW TRUNK	7	3	0	14.5	16	NA	20
01-103-1-Q	MACHINERY VENT PLENUM COMPT	10	5	0	2.9	16	NA	20
01-103-2-Q	MACHINERY VENT PLENUM COMPT	55	27	0	15.8	16	NA	20
02-55-1	VENT SHAFT	20	10	0	15.4	16	NA	20
2-58-1	WW & AC TRUNK	23	11	0	15.1	16	NA	20
CUI=TU	(Stacks/Engine Uptakes)							
1-109-2	UPTAKE	253	114	0	30.3	13	NA	30
1-110-1	UPTAKE	259	116	0	30.2	13	NA	30
01-109-2	UPTAKE	143	64	0	30.2	13	NA	30
01-110-1	UPTAKE	128	57	0	30.2	13	NA	30
02-106-1-Q	STACK	71	32	0	30.3	13	NA	30
02-106-2-Q	STACK	67	30	0	30.2	13	NA	30
CUI=V	(Voids/Cofferdams)							
1-61-1	VOID	1	1	0	3.4	16	NA	10
01-61-1	VOID	1	1	0	3.4	16	NA	10
CUI=W	(Water Tank (empty))							
3-77-0-W	WATER	1	1	0	0.2	10	NA	5

Table B.8 Fire Growth Models, Rates, and FRI Times

Plan ID	Compartment Name	Growth	Alpha	Maximum Q	FRI Time (Min.)			Post-FRI Q (kW)		
		Model	kW/sec2	kW	XRAY	YOKE	ZEBRA	XRAY	YOKE	ZEBRA
CUI=AG	(Gear Locker)									
1-56-1-Q	LOCKER	12	0.1	599	1	1	1	94	94	94
1-62-2-Q	SEABAG LKR	12	0.1	10903	1	1	1	94	94	94
1-65-2-Q	FOUL WEATHER AND LIFE VEST LKR	12	0.1	4567	2	2	2	94	94	94
1-95-1-Q	LIFE JACKET LOCKER	12	0.1	3789	1	1	1	0	0	0
1-117-3-Q	RECREATION LKR	12	0.1	5353	1	1	1	0	0	0
1-201-1-Q	LIFE JACKET LCKR	12	0.1	3820	1	1	1	94	94	94
1-205-1-Q	FOUL WEATHER LIFE VEST LKR	12	0.1	4554	1	1	1	94	94	94
2-80-1-Q	CG LKR	12	0.1	2758	1	1	1	94	94	94
2-165-1-Q	SEABAG LKR	12	0.1	6853	2	2	2	0	0	0
2-186-2-Q	SEA BAG LKR	12	0.1	8469	1	1	1	0	0	0
CUI=AR	(Refrigerated Storage)									
3-175-0-A	REFRIGERATED STORES	4	0.01	3922	5	5	5	0	0	0
CUI=AS	(Storeroom)									
1-53-1-Q	MOVIE LKR	5	0.4	28	999	999	999	28	28	28
1-58-1-L	CREWS LOCKER SPACE	5	0.1	798	2	2	2	109	109	109
1-103-3-A	ELECTRONIC STORES	5	0.1	365	8	8	8	0	0	0
1-103-4-A	ENGINEERS TOOL RM	5	0.1	380	5	5	5	0	0	0
1-121-2-Q	SHIP STORES	5	0.1	242	1	1	1	38	38	38
1-169-1-L	MEDICAL STORES	5	0.1	118	12	12	12	94	94	94
1-186-0-A	ENGINEERS STORES	5	0.1	318	6	6	6	11	11	11
02-106-0-Q	ELEC EQPT SPACE AND STRM	5	0.4	529	999	999	999	436	436	436
3-26A-0-A	STORES	5	0.1	1438	2	2	2	44	44	44
3-169-2-A	STOREROOM	5	0.1	2393	3	3	3	17	17	17
2-26A-0-A	STOREROOMS	5	0.1	1795	2	2	2	0	0	0
2-17-0-A	BOSUN STORES	5	0.1	571	2	2	2	5	5	5
2-59-4-L	CREWS LOCKER SPACE	5	0.1	402	3	3	3	149	149	149
2-64-1-L	CREWS LOCKER SPACE	5	0.4	218	23	23	23	51	51	51
2-175-0-L	CREW LOCKER SPACE	5	0.1	1096	2	2	2	1096	1096	1096
2-194-0-L	CREW LOCKER SPACE	5	0.1	1225	2	2	2	1225	1225	1225
2-207A-0-A	STORAGE AREA	5	0.4	1683	4	4	4	1683	1683	1683
CUI=C	(Ship Control/Communications)									
1-26-1-C	GUN CONTROL BOOTH	7	0.01	976	3	3	3	14	14	14
02-63-0-Q	SENSOR ROOM AND COMMAND SUPPORT CENTER	7	0.01	39836	10	10	10	0	0	0
02-48-0-C	PILOTHOUSE	7	0.01	2435	6	6	6	2435	2435	2435
3-47-0-C	COMMUNICATIONS CENTER	7	0.01	35575	7	7	7	23458	23458	23458
2-47-1-C	IC ROOM	7	0.01	7780	4	4	4	495	495	495
3-152-0-E	ENGINEERING CONTROL CENTER	7	0.01	8353	7	7	7	14	14	14
CUI=EM	(Main Propulsion - Mechanical)									
3-103-0-E	ENGINE ROOM	13	0.2	1282008	3	3	3	78824	78824	78824
3-152A-0-E	ENGINE ROOM EXT	13	0.2	286760	2	2	2	67872	67872	67872
CUI=K	(Hazardous Material Storage)									
1-5-0-K	FLAMMABLE LIQ. STOREROOM	3	0.2	2718	1	1	1	45	45	45
CUI=L1	(Senior Officer's Cabin)									
01-47-2-L	XO STATEROOM	10	0.1	225	7	7	7	127	127	127
01-47-5-L	CO STATEROOM	10	0.01	202	10	10	10	90	90	90
01-58-2-L	EO STATEROOM	10	0.1	219	6	6	6	204	204	204
01-68-3-L	WARDROOM STATEROOM	10	0.01	231	11	11	11	84	84	84

Plan ID	Compartment Name	Growth	Alpha	Maximum Q	FRI Time (Min.)			Post-FRI Q (kW)		
		Model	kW/sec2	kW	XRAY	YOKE	ZEBRA	XRAY	YOKE	ZEBRA
01-82-1-L	PASSENGER STATEROOM	10	0.01	253	12	12	12	86	86	86
CUI=L2	(Officer/CPO Quarters)									
1-165-2-L	CPO STATEROOM	10	0.01	184	2	2	2	137	137	137
1-165-4-L	CPO STATEROOM	10	0.1	243	1	1	1	137	137	137
1-177-0-L	CPO STATEROOM	10	0.01	176	2	2	2	137	137	137
1-199-0-L	CPO STATEROOM	10	0.1	211	1	1	1	137	137	137
1-199-2-L	CPO STATEROOM	10	0.1	206	1	1	1	137	137	137
01-68-4-L	WARDROOM STATEROOM	10	0.01	315	5	5	5	48	48	48
01-84-2-L	WARDROOM STATEROOM	10	0.01	320	5	5	5	121	121	121
01-85-0-L	WARDROOM STATEROOM	10	0.01	269	6	6	6	178	178	178
CUI=L5	(Crews Berthing)									
1-61-2-L	CREWS BERTHING	10	0.1	840	7	7	7	312	312	312
2-47-0-L	CREWS BERTHING	10	0.1	567	7	7	7	416	416	416
2-66-1-L	CREWS BERTHING	10	0.1	487	10	10	10	487	487	487
2-165-3-L	CREW BERTHING AREA	10	0.1	877	10	10	10	654	654	654
2-186-4-L	CREW BERTHING	10	0.1	856	4	4	4	520	520	520
CUI=LL	(Wardroom/Mess/Lounge Areas)									
1-117-0-L	CREW MESS	9	0.2	886	7	7	7	886	886	886
1-117-2-L	WARDROOM	9	0.2	396	7	7	7	396	396	396
1-165-3-L	CPO LOUNGE	9	0.2	150	8	8	8	150	150	150
2-72-2-L	CREWS LOUNGE	9	0.3	389	1	1	1	207	207	207
2-165-2-L	CREWS LOUNGE	9	0.3	327	2	2	2	272	272	272
2-186-1-L	CREW LOUNGE	9	0.3	247	3	3	3	247	247	247
CUI=LM	(Medical/Dental Spaces)									
1-179-1-L	DISPENSARY	9	0.3	263	3	3	3	76	76	76
CUI=LP	(Passageway/Staircase/ Vestibule)									
1-26-2-L	PASSAGEWAY	14	0.01	196	999	999	999	196	0	0
1-47-0-L	PASSAGEWAY	14	0.01	131	999	999	999	131	131	131
1-62-2-L	STAIRWAY	14	0.01	39	999	999	999	39	39	39
1-63-0-L	PASASGEWAY	14	0.01	166	999	999	999	166	166	166
1-82-1-L	PASSAGEWAY	14	0.01	18	999	999	999	18	18	18
1-95-1-L	STAIRWAY	14	0.01	40	999	999	999	40	40	40
1-96-1-L	PASSAGEWAY	14	0.01	140	999	999	999	0	0	0
1-103-1-L	PASSAGEWAY	14	0.01	15	999	999	999	15	15	15
1-103-2-L	VESTIBULE	14	0.01	14	999	999	999	14	14	14
1-113-2-L	PASSAGEWAY	14	0.01	52	999	999	999	52	52	52
1-165-0-L	PASSAGEWAY	14	0.01	81	999	999	999	81	81	81
1-186-0-L	PASSAGEWAY	14	0.01	144	999	999	999	144	144	144
1-207-1-L	VESTIBULE	14	0.01	45	999	999	999	45	45	45
01-63A-2-L	STAIRWAY	14	0.01	44	999	999	999	44	44	44
01-47-1-L	VESTIBULE	14	0.01	23	999	999	999	9	9	9
01-52-0-L	PASSAGEWAY	14	0.01	189	999	999	999	189	189	189
01-68-0-L	PASSAGEWAY	14	0.01	108	999	999	999	108	108	108
01-98-0-L	PASSAGEWAY	14	0.01	85	999	999	999	85	85	85
02-65A-4-L	STAIRWAY	14	0.01	11	999	999	999	11	11	11
02-63-2-L	PASSAGEWAY	14	0.01	194	999	999	999	0	0	0
02-65-2-L	STAIRWAY	14	0.01	11	999	999	999	11	11	11
3-62-2-L	STAIRWAY	14	0.01	11	1	1	1	11	11	11
3-94-1-L	STAIRWAY	14	0.01	11	1	1	1	11	11	11
2-56-0-L	PASSAGEWAY	14	0.01	82	999	999	999	82	82	82
2-64-2-L	STAIRWAY	14	0.01	12	1	1	1	12	12	12
2-95-1-L	STAIRWAY	14	0.01	11	1	1	1	11	11	11
2-178-1-L	STAIRWAY	14	0.01	11	13	13	13	11	11	11

Plan ID	Compartment Name	Growth	Alpha	Maximum Q	FRI Time (Min.)			Post-FRI Q (kW)		
		Model	kW/sec2	kW	XRAY	YOKE	ZEBRA	XRAY	YOKE	ZEBRA
2-199-1-L	STAIRWAY	14	0.01	11	999	999	999	11	11	11
2-210-1-L	STAIRWAY	14	0.01	12	999	999	999	12	12	12
CUI=LW	(Sanitary Spaces)									
1-51-2-L	SANITARY SPACE	16	0.001	1	999	999	999	1	1	1
1-174-2-L	SANITARY SPACE	16	0.001	3	999	999	999	3	3	3
1-186-4-L	SANITARY SPACE	16	0.001	3	999	999	999	3	3	3
01-47-3-L	SANITARY SPACE	16	0.001	2	999	999	999	2	2	2
01-47-4-L	SANITARY SPACE	16	0.001	2	999	999	999	2	2	2
01-68-2-L	SANITARY SPACE	16	0.001	2	999	999	999	2	2	2
01-81-1-L	SANITARY SPACE	16	0.001	2	999	999	999	2	2	2
01-89-2-L	SANITARY SPACE	16	0.001	2	999	999	999	2	2	2
01-94-2-L	DECONTAMINATION SHOWER	16	0.001	2	999	999	999	0	0	0
02-72-2-L	SANITARY SPACE	16	0.001	2	999	999	999	2	2	2
2-58-1-L	SANITARY SPACE	16	0.001	2	999	999	999	2	2	2
2-59-2-L	SANITARY SPACE	16	0.001	2	999	999	999	2	2	2
2-75-0-L	SANITARY SPACE	16	0.001	2	999	999	999	2	2	2
3-160-2-L	SANITARY SPACE	16	0.001	2	999	999	999	2	2	2
2-165-0-L	SANITARY SPACE	16	0.001	3	999	999	999	3	3	3
2-186-0-L	SANITARY SPACE	16	0.001	3	999	999	999	3	3	3
CUI=QA	(Aux Machinery Spaces)									
1-186-2-Q	COMPUTER ROOM	13	0.2	29956	1	1	1	47	47	47
1-207-3-J	JP-5 FUELING	13	0.2	16788	1	1	1	164	164	164
01-94-1-Q	WINCH MACH. SPACE	13	0.2	26549	1	1	1	2	2	2
3-82-0-E	AUXILIARY MACHINE SPACE NO. 2	13	0.2	294972	2	2	2	28220	28220	28220
4-186-0-J	JP-5 PUMP ROOM	13	0.2	128064	2	2	2	113	113	113
2-82-0-E	AMS NO 1	13	0.2	444168	2	2	2	35737	35737	35737
3-228-0-E	STEERING GEAR ROOM	13	0.2	61908	2	2	2	2988	873	873
CUI=QF	(Fan Room)									
1-43-2-Q	FAN ROOM	13	0.2	5040	1	1	1	0	0	0
1-117-1-Q	FAN ROOM	13	0.2	1083	1	1	1	0	0	0
1-207-2-Q	FAN ROOM	13	0.2	2218	1	1	1	0	0	0
02-45-0-Q	FAN SPACE	13	0.2	16338	2	2	2	0	0	0
2-207-1-Q	FAN ROOM	13	0.2	3463	1	1	1	0	0	0
CUI=QG	(Galley/Pantry/Scullery)									
1-129-2-Q	SCULLERY	13	0.2	2406	1	1	1	2406	2406	2406
1-141-2-Q	GALLEY	13	0.2	1467	1	1	1	1467	1467	1467
1-186-3-Q	TRASH COMPACTOR SPACE	13	0.2	4413	1	1	1	76	76	76
CUI=QL	(Laundry)									
1-47-1-Q	LAUNDRY	12	0.1	3589	2	2	2	346	346	346
CUI=QO	(Office Spaces)									
1-73-1-Q	ENGINEERS OFFICE	8	0.3	376	1	1	1	281	281	281
1-82-3-Q	SHIP AND SUPPLY OFFICE	8	0.3	587	1	1	1	308	308	308
01-61-1-Q	CO OFFICE	8	0.3	125	10	10	10	124	124	124
CUI=QS	(Shops)									
1-12-0-Q	ANCHOR WINDLASS RM AND BOSUN'S WORKSHOP	5	0.4	462	999	999	999	462	12	12
1-82-2-Q	FORWARD REPAIR #2	5	0.1	216	38	38	38	23	23	23
1-82-4-Q	ENGINEERS WORKSHOP	5	0.4	448	999	999	999	5	5	5
1-90-2-Q	ELCTRICIANS WORKSHOP	5	0.4	74	999	999	999	18	18	18
01-103-0-Q	AVIONICS SHOP	5	0.4	290	999	999	999	10	10	10
2-40-1-Q	ORDNANCE WORKSHOP	5	0.1	144	999	999	999	144	144	144
3-152-2-E	ENGINEERS WORK SPACE	5	0.1	197	999	999	999	81	81	81
2-221-1-Q	AFT REPAIR #3	5	0.4	129	999	999	999	129	129	129

Plan ID	Compartment Name	Growth	Alpha	Maximum Q	FRI Time (Min.)			Post-FRI Q (kW)		
		Model	kW/sec2	kW	XRAY	YOKE	ZEBRA	XRAY	YOKE	ZEBRA
CUI=TH	(Trunks/Hoists/Dumbwaiters)									
1-55-1	VENT SHAFT	16	0.001	4	999	999	999	0	0	0
1-63-1	AC&WW TRUNK	16	0.001	1	999	999	999	0	0	0
3-165-1-Q	SERVICE ELEVATOR TRUNK	16	0.001	4	999	999	999	0	0	0
01-55-1	VENT SHAFT	16	0.001	4	999	999	999	0	0	0
01-63-1	AC & WW TRUNK	16	0.001	1	999	999	999	0	0	0
01-103-1-Q	MACHINERY VENT PLENUM COMPT	16	0.001	2	999	999	999	0	0	0
01-103-2-Q	MACHINERY VENT PLENUM COMPT	16	0.001	11	999	999	999	0	0	0
02-55-1	VENT SHAFT	16	0.001	4	999	999	999	0	0	0
2-58-1	WW & AC TRUNK	16	0.001	5	999	999	999	0	0	0
CUI=TU	(Stacks/Engine Uptakes)									
1-109-2	UPTAKE	13	0.2	11579	1	1	1	0	0	0
1-110-1	UPTAKE	13	0.2	11830	2	2	2	0	0	0
01-109-2	UPTAKE	13	0.2	6545	1	1	1	0	0	0
01-110-1	UPTAKE	13	0.2	5873	1	1	1	0	0	0
02-106-1-Q	STACK	13	0.2	3247	2	2	2	0	0	0
02-106-2-Q	STACK	13	0.2	3068	2	2	2	0	0	0
CUI=V	(Voids/Cofferdams)									
1-61-1	VOID	16	0.001	0	999	999	999	0	0	0
01-61-1	VOID	16	0.001	0	999	999	999	0	0	0
CUI=W	(Water Tank (empty))									
3-77-0-W	WATER	10	0.01	20	999	999	999	0	0	0

Appendix C
270' WMEC Baseline Fire Safety Analysis Results

The various reports produced in the performance of the baseline fire safety analysis on thed 270' WMEC using the target, barrier, and path output options in SAFE, version 2.2, are documented in t his appendix. The following table correlates the results from SAFE computer run numbers with page numbers in this appendix:

SAFE Run Number	SAFE Output Otpion	Scenario	Page Number
17-81	Individual Target Option	XRAY, In Port, I, A, & M	C-2
17-82	Individual Target Option	XRAY, In Port, I & A	C-3
17-83	Individual Target Option	XRAY, In Port, I & M	C-4
17-84	Individual Target Option	XRAY, In Port, I	C-5
17-85	Individual Target Option	YOKE, In Port, I, A, & M	C-6
17-86	Individual Target Option	YOKE, In Port, I & A	C-7
17-87	Individual Target Option	YOKE, In Port, I & M	C-8
17-88	Individual Target Option	YOKE, In Port, I	C-9
19-101	Individual Target Option	YOKE, At Sea, I, A, & M	C-10
19-102	Individual Target Option	YOKE, At Sea, I & A	C-11
19-103	Individual Target Option	YOKE, At Sea, I & M	C-12
19-104	Individual Target Option	YOKE, At Sea, I	C-13
17-97	Barrier Option	YOKE, In Port, I, A, & M	C-14
17-98	Path Option - Summary Report Room of Origin: 2-82-0-E	YOKE, In Port, I, A, & M	C-23
17-98	Path Option - Detail Report Room of Origin: 2-82-0-E	YOKE, In Port, I, A, & M	C-24
17-99	Path Option - Summary Report Room of Origin: 3-82-0-E	YOKE, In Port, I, A, & M	C-33
17-99	Path Option - Detail Report Room of Origin: 3-82-0-E	YOKE, In Port, I, A, & M	C-35
17-100	Path Option - Summary Report Room of Origin: 3-103-0-E	YOKE, In Port, I, A, & M	C-49
17-100	Path Option - Detail Report Room of Origin: 3-103-0-E	YOKE, In Port, I, A, & M	C-50

SPENCER
08/04/98
MODEL RUN 17-81

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . XRAY
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0321	0.8357
2-82-0-E	2	26 years	0.0299	0.7776
3-103-0-E	2	26 years	0.0280	0.7274
3-152A-0-E	2	26 years	0.0272	0.7072
3-152-2-E	2	22 years	0.0311	0.6853
3-82-0-E	2	26 years	0.0181	0.4715
2-72-2-L	2	20 years	0.0211	0.4219
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0009	0.0230
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-207A-0-A	3	15 years	0.0008	0.0113
2-186-1-L	2	20 years	0.0005	0.0097
1-109-2	2	23 years	0.0004	0.0082
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 17-82

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . XRAY
CONFIGURATION . . . . Passive and Automatic
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0414	1.0773
2-82-0-E	2	26 years	0.0370	0.9630
3-152-2-E	2	22 years	0.0432	0.9508
3-103-0-E	2	26 years	0.0322	0.8371
3-152A-0-E	2	26 years	0.0307	0.7982
3-82-0-E	2	26 years	0.0212	0.5507
2-72-2-L	2	20 years	0.0263	0.5267
2-165-2-L	2	20 years	0.0080	0.1602
1-117-0-L	2	24 years	0.0036	0.0865
1-117-2-L	2	24 years	0.0031	0.0741
1-129-2-Q	2	20 years	0.0027	0.0535
1-141-2-Q	2	26 years	0.0020	0.0516
1-201-1-Q	2	21 years	0.0022	0.0454
1-165-3-L	2	24 years	0.0014	0.0345
1-169-1-L	2	25 years	0.0014	0.0342
2-47-1-C	2	26 years	0.0012	0.0301
02-48-0-C	2	26 years	0.0011	0.0299
3-47-0-C	2	26 years	0.0011	0.0288
3-228-0-E	2	26 years	0.0011	0.0280
2-186-1-L	2	20 years	0.0008	0.0156
2-207A-0-A	3	15 years	0.0010	0.0152
1-109-2	2	23 years	0.0006	0.0130
1-179-1-L	2	25 years	0.0003	0.0071
02-63-0-Q	2	26 years	0.0002	0.0062
1-103-4-A	2	23 years	0.0003	0.0059
1-186-0-A	2	25 years	0.0002	0.0050
1-186-2-Q	2	26 years	0.0001	0.0035

SPENCER
08/04/98
MODEL RUN 17-83

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . XRAY
CONFIGURATION . . . . Passive and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0321	0.8357
2-82-0-E	2	26 years	0.0299	0.7776
3-103-0-E	2	26 years	0.0280	0.7274
3-152A-0-E	2	26 years	0.0272	0.7072
3-152-2-E	2	22 years	0.0311	0.6853
3-82-0-E	2	26 years	0.0181	0.4715
2-72-2-L	2	20 years	0.0211	0.4219
2-165-2-L	2	20 years	0.0049	0.0986
1-141-2-Q	2	26 years	0.0029	0.0764
1-117-0-L	2	24 years	0.0030	0.0713
1-117-2-L	2	24 years	0.0023	0.0557
1-129-2-Q	2	20 years	0.0026	0.0527
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0009	0.0230
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
1-169-1-L	2	25 years	0.0008	0.0193
3-47-0-C	2	26 years	0.0007	0.0189
1-165-3-L	2	24 years	0.0005	0.0131
2-207A-0-A	3	15 years	0.0008	0.0113
2-186-1-L	2	20 years	0.0005	0.0097
1-109-2	2	23 years	0.0004	0.0082
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 17-84

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . XRAY
CONFIGURATION . . . . Passive
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0414	1.0773
2-82-0-E	2	26 years	0.0370	0.9630
3-152-2-E	2	22 years	0.0432	0.9508
3-103-0-E	2	26 years	0.0322	0.8371
3-152A-0-E	2	26 years	0.0307	0.7982
3-82-0-E	2	26 years	0.0212	0.5507
2-72-2-L	2	20 years	0.0263	0.5267
2-165-2-L	2	20 years	0.0080	0.1602
1-117-0-L	2	24 years	0.0043	0.1043
1-141-2-Q	2	26 years	0.0034	0.0889
1-117-2-L	2	24 years	0.0035	0.0849
1-129-2-Q	2	20 years	0.0031	0.0616
1-201-1-Q	2	21 years	0.0022	0.0454
1-169-1-L	2	25 years	0.0016	0.0400
1-165-3-L	2	24 years	0.0015	0.0359
2-47-1-C	2	26 years	0.0012	0.0301
02-48-0-C	2	26 years	0.0011	0.0299
3-47-0-C	2	26 years	0.0011	0.0288
3-228-0-E	2	26 years	0.0011	0.0280
2-186-1-L	2	20 years	0.0008	0.0156
2-207A-0-A	3	15 years	0.0010	0.0152
1-109-2	2	23 years	0.0006	0.0132
1-179-1-L	2	25 years	0.0003	0.0071
02-63-0-Q	2	26 years	0.0002	0.0062
1-103-4-A	2	23 years	0.0003	0.0059
1-186-0-A	2	25 years	0.0002	0.0050
1-186-2-Q	2	26 years	0.0001	0.0035

SPENCER
08/04/98
MODEL RUN 17-85

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0321	0.8357
2-82-0-E	2	26 years	0.0299	0.7776
3-103-0-E	2	26 years	0.0280	0.7274
3-152A-0-E	2	26 years	0.0272	0.7072
3-152-2-E	2	22 years	0.0311	0.6853
3-82-0-E	2	26 years	0.0181	0.4715
2-72-2-L	2	20 years	0.0211	0.4219
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 17-86

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive and Automatic
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0414	1.0773
2-82-0-E	2	26 years	0.0370	0.9630
3-152-2-E	2	22 years	0.0432	0.9508
3-103-0-E	2	26 years	0.0322	0.8371
3-152A-0-E	2	26 years	0.0307	0.7982
3-82-0-E	2	26 years	0.0212	0.5507
2-72-2-L	2	20 years	0.0263	0.5267
2-165-2-L	2	20 years	0.0080	0.1602
1-117-0-L	2	24 years	0.0036	0.0865
1-117-2-L	2	24 years	0.0031	0.0741
1-129-2-Q	2	20 years	0.0027	0.0535
1-141-2-Q	2	26 years	0.0020	0.0516
1-201-1-Q	2	21 years	0.0022	0.0454
1-165-3-L	2	24 years	0.0014	0.0345
1-169-1-L	2	25 years	0.0014	0.0342
2-47-1-C	2	26 years	0.0012	0.0301
02-48-0-C	2	26 years	0.0011	0.0299
3-47-0-C	2	26 years	0.0011	0.0288
3-228-0-E	2	26 years	0.0010	0.0254
2-186-1-L	2	20 years	0.0007	0.0135
1-109-2	2	23 years	0.0006	0.0130
1-179-1-L	2	25 years	0.0003	0.0071
2-207A-0-A	3	15 years	0.0005	0.0069
02-63-0-Q	2	26 years	0.0002	0.0062
1-103-4-A	2	23 years	0.0003	0.0059
1-186-0-A	2	25 years	0.0002	0.0050
1-186-2-Q	2	26 years	0.0001	0.0035

SPENCER
08/04/98
MODEL RUN 17-87

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0321	0.8357
2-82-0-E	2	26 years	0.0299	0.7776
3-103-0-E	2	26 years	0.0280	0.7274
3-152A-0-E	2	26 years	0.0272	0.7072
3-152-2-E	2	22 years	0.0311	0.6853
3-82-0-E	2	26 years	0.0181	0.4715
2-72-2-L	2	20 years	0.0211	0.4219
2-165-2-L	2	20 years	0.0049	0.0986
1-141-2-Q	2	26 years	0.0029	0.0764
1-117-0-L	2	24 years	0.0030	0.0713
1-117-2-L	2	24 years	0.0023	0.0557
1-129-2-Q	2	20 years	0.0026	0.0527
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
1-169-1-L	2	25 years	0.0008	0.0193
3-47-0-C	2	26 years	0.0007	0.0189
1-165-3-L	2	24 years	0.0005	0.0131
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 17-88

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0414	1.0773
2-82-0-E	2	26 years	0.0370	0.9630
3-152-2-E	2	22 years	0.0432	0.9508
3-103-0-E	2	26 years	0.0322	0.8371
3-152A-0-E	2	26 years	0.0307	0.7982
3-82-0-E	2	26 years	0.0212	0.5507
2-72-2-L	2	20 years	0.0263	0.5267
2-165-2-L	2	20 years	0.0080	0.1602
1-117-0-L	2	24 years	0.0043	0.1043
1-141-2-Q	2	26 years	0.0034	0.0889
1-117-2-L	2	24 years	0.0035	0.0849
1-129-2-Q	2	20 years	0.0031	0.0616
1-201-1-Q	2	21 years	0.0022	0.0454
1-169-1-L	2	25 years	0.0016	0.0400
1-165-3-L	2	24 years	0.0015	0.0359
2-47-1-C	2	26 years	0.0012	0.0301
02-48-0-C	2	26 years	0.0011	0.0299
3-47-0-C	2	26 years	0.0011	0.0288
3-228-0-E	2	26 years	0.0010	0.0254
2-186-1-L	2	20 years	0.0007	0.0135
1-109-2	2	23 years	0.0006	0.0132
1-179-1-L	2	25 years	0.0003	0.0071
2-207A-0-A	3	15 years	0.0005	0.0069
02-63-0-Q	2	26 years	0.0002	0.0062
1-103-4-A	2	23 years	0.0003	0.0059
1-186-0-A	2	25 years	0.0002	0.0050
1-186-2-Q	2	26 years	0.0001	0.0035

SPENCER
08/04/98
MODEL RUN 19-101

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . at SEA
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, At-Sea M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

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TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
2-82-0-E	2	26 years	0.0299	0.7763
3-103-0-E	2	26 years	0.0280	0.7273
3-152-0-E	2	26 years	0.0274	0.7113
3-152A-0-E	2	26 years	0.0272	0.7071
3-152-2-E	2	22 years	0.0296	0.6513
3-82-0-E	2	26 years	0.0181	0.4714
2-72-2-L	2	20 years	0.0211	0.4214
2-165-2-L	2	20 years	0.0047	0.0942
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0464
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
2-47-1-C	2	26 years	0.0007	0.0182
3-47-0-C	2	26 years	0.0007	0.0180
1-169-1-L	2	25 years	0.0007	0.0178
02-48-0-C	2	26 years	0.0006	0.0148
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0024
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0011

SPENCER
08/04/98
MODEL RUN 19-102

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive and Automatic
CASE. . . . . Worst
ASSUMED LOCATION. . . at SEA
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, At-Sea M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0414	1.0773
2-82-0-E	2	26 years	0.0370	0.9630
3-152-2-E	2	22 years	0.0432	0.9508
3-103-0-E	2	26 years	0.0322	0.8371
3-152A-0-E	2	26 years	0.0307	0.7982
3-82-0-E	2	26 years	0.0212	0.5507
2-72-2-L	2	20 years	0.0263	0.5267
2-165-2-L	2	20 years	0.0080	0.1602
1-117-0-L	2	24 years	0.0036	0.0865
1-117-2-L	2	24 years	0.0031	0.0741
1-129-2-Q	2	20 years	0.0027	0.0535
1-141-2-Q	2	26 years	0.0020	0.0516
1-201-1-Q	2	21 years	0.0022	0.0454
1-165-3-L	2	24 years	0.0014	0.0345
1-169-1-L	2	25 years	0.0014	0.0342
2-47-1-C	2	26 years	0.0012	0.0301
02-48-0-C	2	26 years	0.0011	0.0299
3-47-0-C	2	26 years	0.0011	0.0288
3-228-0-E	2	26 years	0.0010	0.0254
2-186-1-L	2	20 years	0.0007	0.0135
1-109-2	2	23 years	0.0006	0.0130
1-179-1-L	2	25 years	0.0003	0.0071
2-207A-0-A	3	15 years	0.0005	0.0069
02-63-0-Q	2	26 years	0.0002	0.0062
1-103-4-A	2	23 years	0.0003	0.0059
1-186-0-A	2	25 years	0.0002	0.0050
1-186-2-Q	2	26 years	0.0001	0.0035

SPENCER
08/04/98
MODEL RUN 19-103

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . at SEA
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, At-Sea M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
2-82-0-E	2	26 years	0.0299	0.7763
3-103-0-E	2	26 years	0.0280	0.7273
3-152-0-E	2	26 years	0.0274	0.7113
3-152A-0-E	2	26 years	0.0272	0.7071
3-152-2-E	2	22 years	0.0296	0.6513
3-82-0-E	2	26 years	0.0181	0.4714
2-72-2-L	2	20 years	0.0211	0.4214
2-165-2-L	2	20 years	0.0047	0.0942
1-141-2-Q	2	26 years	0.0029	0.0763
1-117-0-L	2	24 years	0.0030	0.0712
1-117-2-L	2	24 years	0.0023	0.0557
1-129-2-Q	2	20 years	0.0026	0.0527
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
1-169-1-L	2	25 years	0.0008	0.0193
2-47-1-C	2	26 years	0.0007	0.0182
3-47-0-C	2	26 years	0.0007	0.0180
02-48-0-C	2	26 years	0.0006	0.0148
1-165-3-L	2	24 years	0.0005	0.0131
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0024
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0011

SPENCER
08/04/98
MODEL RUN 19-104

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive
CASE. . . . . Worst
ASSUMED LOCATION. . . at SEA
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, At-Sea M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0414	1.0773
2-82-0-E	2	26 years	0.0370	0.9630
3-152-2-E	2	22 years	0.0432	0.9508
3-103-0-E	2	26 years	0.0322	0.8371
3-152A-0-E	2	26 years	0.0307	0.7982
3-82-0-E	2	26 years	0.0212	0.5507
2-72-2-L	2	20 years	0.0263	0.5267
2-165-2-L	2	20 years	0.0080	0.1602
1-117-0-L	2	24 years	0.0043	0.1043
1-141-2-Q	2	26 years	0.0034	0.0889
1-117-2-L	2	24 years	0.0035	0.0849
1-129-2-Q	2	20 years	0.0031	0.0616
1-201-1-Q	2	21 years	0.0022	0.0454
1-169-1-L	2	25 years	0.0016	0.0400
1-165-3-L	2	24 years	0.0015	0.0359
2-47-1-C	2	26 years	0.0012	0.0301
02-48-0-C	2	26 years	0.0011	0.0299
3-47-0-C	2	26 years	0.0011	0.0288
3-228-0-E	2	26 years	0.0010	0.0254
2-186-1-L	2	20 years	0.0007	0.0135
1-109-2	2	23 years	0.0006	0.0132
1-179-1-L	2	25 years	0.0003	0.0071
2-207A-0-A	3	15 years	0.0005	0.0069
02-63-0-Q	2	26 years	0.0002	0.0062
1-103-4-A	2	23 years	0.0003	0.0059
1-186-0-A	2	25 years	0.0002	0.0050
1-186-2-Q	2	26 years	0.0001	0.0035

SPENCER
08/04/98
MODEL RUN 17-97

ROOM OF ORIGIN BARRIER OPTION - SUMMARY LEVEL REPORT

LISTING OF ROOM OF ORIGIN BARRIER FAILURES
ORDERED BY ROOM OF ORIGIN AND SECONDARILY BY
PROBABILITY OF LOSS|EB AT TIME OF BARRIER FAILURE

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

---------Room of Origin----------				-------Barrier to Adjacent Room-------				
Plan ID	FRI Time	P(Loss) |EB	RFL|FFS (x 1000)	Adj. Room Plan ID	Fail Time	P(Loss) |EB	RFL|FFS (x 1000)	Opening/ Zero-Str
1-5-0-K	1	0.72	0.94	ext. blkhd.	1	0.36	0.47	
1-47-1-Q	2	0.61	1.88	1-58-1-L	3	0.28	0.88	
				1-53-1-Q	3	0.28	0.88	
				1-53-1-Q	3	0.28	0.88	
				1-55-1	18	0.07	0.22	
				1-55-1	18	0.07	0.22	
				01-47-5-L	18	0.07	0.22	
				01-47-3-L	18	0.07	0.22	
				01-47-1-L	18	0.07	0.22	
				1-47-0-L	18	0.07	0.22	
				not analyzed	18	0.07	0.22	
				ext. blkhd.	18	0.07	0.22	
				ext. ovrhd.	18	0.07	0.22	
1-56-1-Q	1	0.31	0.31	1-53-1-Q	1	0.30	0.30	
				01-52-0-L	5	0.05	0.05	
				1-55-1	5	0.05	0.05	
				1-47-0-L	5	0.05	0.05	
				1-47-0-L	5	0.05	0.05	
1-58-1-L	2	0.41	0.37	1-47-1-Q	6	0.18	0.17	
				01-47-5-L	44	0.05	0.04	
				01-61-1-Q	51	0.05	0.04	
1-61-2-L	7	0.36	0.29	1-62-2-Q	15	0.16	0.13	
				1-62-2-Q	15	0.16	0.13	
				1-51-2-L	15	0.16	0.13	
				01-58-2-L	35	0.05	0.04	
				01-68-4-L	43	0.04	0.03	
				01-68-2-L	43	0.04	0.03	
				01-68-0-L	43	0.04	0.03	
				1-65-2-Q	30	0.04	0.03	
				1-65-2-Q	30	0.04	0.03	
1-62-2-Q	1	0.77	0.77	1-65-2-Q	1	0.35	0.35	
				1-51-2-L	1	0.35	0.35	
				1-61-2-L	3	0.35	0.35	
				1-61-2-L	3	0.35	0.35	
				01-58-2-L	11	0.08	0.08	
				01-52-0-L	11	0.08	0.08	
				01-63A-2-L	11	0.08	0.08	
				1-62-2-L	11	0.08	0.08	

				1-47-0-L	11	0.08	0.08	
1-65-2-Q	2	0.71	0.71	1-62-2-Q	2	0.33	0.33	
				01-68-2-L	12	0.08	0.08	

---------Room of Origin----------				-------Barrier to Adjacent Room-------				
Plan ID	FRI Time	P(Loss) |EB	RFL|FFS (x 1000)	Adj. Room Plan ID	Fail Time	P(Loss) |EB	RFL|FFS (x 1000)	Opening/ Zero-Str
				01-68-0-L	12	0.08	0.08	
				01-52-0-L	12	0.08	0.08	
				01-63A-2-L	12	0.08	0.08	
				1-63-0-L	12	0.08	0.08	
				1-62-2-L	12	0.08	0.08	
				1-61-2-L	21	0.07	0.07	
				1-61-2-L	21	0.07	0.07	
1-73-1-Q	1	0.55	0.22	01-82-1-L	21	0.06	0.02	
				01-81-1-L	21	0.06	0.02	
				01-68-3-L	21	0.06	0.02	
				01-68-0-L	21	0.06	0.02	
				1-63-0-L	21	0.06	0.02	
				1-58-1-L	21	0.06	0.02	
				ext. blkhd.	21	0.06	0.02	
				1-82-3-Q	26	0.06	0.02	
1-82-3-Q	1	0.55	0.22	1-96-1-L	30	0.06	0.03	
				1-95-1-L	30	0.06	0.03	
				01-82-1-L	30	0.06	0.03	
				01-68-0-L	30	0.06	0.03	
				01-94-1-Q	30	0.06	0.03	
				1-82-1-L	30	0.06	0.03	
				1-82-1-L	30	0.06	0.03	
				1-82-1-L	30	0.06	0.03	
				ext. blkhd.	30	0.06	0.03	
				ext. blkhd.	30	0.06	0.03	
				ext. blkhd.	30	0.06	0.03	
				1-73-1-Q	36	0.06	0.02	
1-117-0-L	7	0.27	0.22	1-141-2-Q	7	0.27	0.22	Opening
				1-129-2-Q	7	0.27	0.22	Opening
				1-103-1-L	7	0.27	0.22	Zero-Str
				1-117-2-L	24	0.03	0.03	
				3-165-1-Q	47	0.03	0.02	
				1-165-3-L	47	0.03	0.02	
				1-165-0-L	47	0.03	0.02	
				1-117-3-Q	47	0.03	0.02	
				1-117-1-Q	47	0.03	0.02	
				1-117-1-Q	47	0.03	0.02	
				not analyzed	47	0.03	0.02	
				ext. blkhd.	47	0.03	0.02	
				ext. ovrhd.	47	0.03	0.02	
1-117-2-L	7	0.36	0.29	ext. blkhd.	47	0.04	0.03	
				1-141-2-Q	47	0.04	0.03	
				1-141-2-Q	47	0.04	0.03	
				1-129-2-Q	47	0.04	0.03	
				1-129-2-Q	47	0.04	0.03	
				1-129-2-Q	47	0.04	0.03	
				1-121-2-Q	47	0.04	0.03	
				1-121-2-Q	47	0.04	0.03	
				not analyzed	47	0.04	0.03	
				1-117-0-L	47	0.04	0.03	
				1-113-2-L	47	0.04	0.03	

1-109-2	47	0.04	0.03
1-103-4-A	47	0.04	0.03
ext. blkhd.	47	0.04	0.03
ext. ovrhd.	47	0.04	0.03

Room of Origin				Barrier to Adjacent Room				
Plan ID	FRI Time	P(Loss) |EB	RFL|FFS (x 1000)	Adj. Room Plan ID	Fail Time	P(Loss) |EB	RFL|FFS (x 1000)	Opening/ Zero-Str
1-121-2-Q	1	0.60	0.54	1-129-2-Q	54	0.06	0.05	
				not analyzed	54	0.06	0.05	
				1-117-2-L	54	0.06	0.05	
				1-117-2-L	54	0.06	0.05	
				1-117-0-L	54	0.06	0.05	
1-129-2-Q	1	0.40	1.05	1-141-2-Q	1	0.40	1.05	Opening
				1-117-0-L	1	0.40	1.05	Opening
				not analyzed	2	0.06	0.15	
				1-121-2-Q	2	0.06	0.15	
				1-117-2-L	2	0.06	0.15	
				1-117-2-L	2	0.06	0.15	
				1-117-2-L	2	0.06	0.15	
				ext. ovrhd.	2	0.06	0.15	
1-141-2-Q	1	0.41	1.06	1-129-2-Q	1	0.41	1.06	Opening
				1-117-0-L	1	0.41	1.06	Opening
				1-117-2-L	11	0.05	0.14	
				1-117-2-L	11	0.05	0.14	
				1-165-4-L	12	0.04	0.11	
				1-165-2-L	12	0.04	0.11	
				ext. blkhd.	12	0.04	0.11	
				ext. ovrhd.	12	0.04	0.11	
1-165-2-L	2	0.46	0.37	1-169-1-L	28	0.05	0.04	
				3-165-1-Q	28	0.05	0.04	
				1-165-0-L	28	0.05	0.04	
				1-141-2-Q	28	0.05	0.04	
				ext. ovrhd.	28	0.05	0.04	
				1-165-4-L	34	0.05	0.04	
1-165-3-L	8	0.33	0.26	1-179-1-L	48	0.03	0.03	
				1-165-0-L	48	0.03	0.03	
				1-117-0-L	48	0.03	0.03	
				ext. blkhd.	48	0.03	0.03	
				ext. ovrhd.	48	0.03	0.03	
1-165-4-L	1	0.51	0.41	1-174-2-L	3	0.24	0.19	
				1-165-0-L	28	0.06	0.05	
				1-141-2-Q	28	0.06	0.05	
				ext. blkhd.	28	0.06	0.05	
				ext. ovrhd.	28	0.06	0.05	
				1-165-2-L	34	0.05	0.04	
1-169-1-L	12	0.46	0.41	3-165-1-Q	22	0.05	0.05	
				1-165-2-L	22	0.05	0.05	
				1-165-0-L	22	0.05	0.05	
				1-165-0-L	22	0.05	0.05	
				1-165-0-L	22	0.05	0.05	
				1-165-0-L	22	0.05	0.05	
				ext. ovrhd.	22	0.05	0.05	
1-177-0-L	2	0.46	0.37	1-186-2-Q	27	0.05	0.04	
				1-186-0-A	27	0.05	0.04	
				1-174-2-L	27	0.05	0.04	
				1-165-0-L	27	0.05	0.04	
				1-165-0-L	27	0.05	0.04	

				ext. ovrhd.	27	0.05	0.04	
1-179-1-L	3	0.55	0.11	1-186-3-Q	42	0.06	0.01	
				1-165-3-L	42	0.06	0.01	
				1-165-0-L	42	0.06	0.01	
				ext. blkhd.	42	0.06	0.01	

---------Room of Origin----------				-------Barrier to Adjacent Room-------				
Plan ID	FRI Time	P(Loss) |EB	RFL|FFS (x 1000)	Adj. Room Plan ID	Fail Time	P(Loss) |EB	RFL|FFS (x 1000)	Opening/ Zero-Str
				ext. ovrhd.	42	0.06	0.01	
1-199-0-L	1	0.51	0.41	ext. blkhd.	24	0.06	0.05	
				1-207-2-Q	24	0.06	0.05	
				1-207-1-L	24	0.06	0.05	
				1-205-1-Q	24	0.06	0.05	
				1-186-0-L	24	0.06	0.05	
				1-186-0-L	24	0.06	0.05	
				ext. ovrhd.	24	0.06	0.05	
				1-199-2-L	29	0.05	0.04	
1-199-2-L	1	0.51	0.41	1-199-0-L	29	0.05	0.04	
				1-186-4-L	23	0.05	0.04	
				1-186-0-L	23	0.05	0.04	
				ext. blkhd.	23	0.05	0.04	
				ext. blkhd.	23	0.05	0.04	
				ext. ovrhd.	23	0.05	0.04	
1-201-1-Q	1	0.77	0.77	1-207-3-J	9	0.08	0.08	
				1-186-3-Q	9	0.08	0.08	
				1-186-3-Q	9	0.08	0.08	
				1-186-0-L	9	0.08	0.08	
				ext. ovrhd.	9	0.08	0.08	
1-205-1-Q	1	0.77	0.77	1-186-0-L	1	0.75	0.75	
				1-207-1-L	4	0.17	0.17	
				1-199-0-L	4	0.17	0.17	
				1-186-0-L	4	0.17	0.17	
				ext. ovrhd.	4	0.17	0.17	
1-207-3-J	1	0.63	1.84	1-207-1-L	12	0.07	0.21	
				1-201-1-Q	12	0.07	0.21	
				1-186-3-Q	12	0.07	0.21	
				ext. blkhd.	12	0.07	0.21	
				ext. blkhd.	12	0.07	0.21	
				ext. ovrhd.	12	0.07	0.21	
01-47-2-L	7	0.26	0.21	01-47-4-L	9	0.12	0.10	
				01-58-2-L	51	0.03	0.02	
				01-52-0-L	42	0.03	0.02	
				01-52-0-L	42	0.03	0.02	
				02-45-0-Q	42	0.03	0.02	
				01-47-1-L	42	0.03	0.02	
				ext. blkhd.	42	0.03	0.02	
01-47-5-L	10	0.26	0.20	01-47-3-L	14	0.12	0.09	
				01-47-3-L	14	0.12	0.09	
				01-47-3-L	14	0.12	0.09	
				01-61-1-Q	14	0.12	0.09	
01-58-2-L	6	0.26	0.21	01-47-4-L	7	0.12	0.10	
				ext. blkhd.	27	0.03	0.02	
				01-68-2-L	27	0.03	0.02	
				02-63-2-L	27	0.03	0.02	
				02-45-0-Q	27	0.03	0.02	
				02-65A-4-L	27	0.03	0.02	

				01-52-0-L	27	0.03	0.02	
				01-63A-2-L	27	0.03	0.02	
				ext. blkhd.	27	0.03	0.02	
				ext. ovrhd.	27	0.03	0.02	
				01-68-4-L	32	0.03	0.02	
				01-47-2-L	32	0.03	0.02	
01-61-1-Q	10	0.44	0.18	01-47-5-L	11	0.20	0.08	

---------Room of Origin----------				-------Barrier to Adjacent Room-------				
Plan ID	FRI Time	P(Loss) |EB	RFL|FFS (x 1000)	Adj. Room Plan ID	Fail Time	P(Loss) |EB	RFL|FFS (x 1000)	Opening/ Zero-Str
				01-63-1	35	0.05	0.02	
				02-63-0-Q	35	0.05	0.02	
				02-45-0-Q	35	0.05	0.02	
				01-61-1	35	0.05	0.02	
				01-52-0-L	35	0.05	0.02	
				ext. blkhd.	35	0.05	0.02	
				ext. ovrhd.	35	0.05	0.02	
				01-68-3-L	41	0.05	0.02	
01-68-3-L	11	0.26	0.20	01-81-1-L	16	0.12	0.09	
01-68-4-L	5	0.33	0.26	01-68-2-L	14	0.15	0.12	
01-82-1-L	12	0.26	0.20	01-81-1-L	17	0.11	0.09	
01-84-2-L	5	0.33	0.26	ext. blkhd.	57	0.04	0.03	
				01-98-0-L	57	0.04	0.03	
				01-94-2-L	57	0.04	0.03	
				01-89-2-L	57	0.04	0.03	
				01-89-2-L	57	0.04	0.03	
				02-63-0-Q	57	0.04	0.03	
				01-68-0-L	57	0.04	0.03	
				01-68-0-L	57	0.04	0.03	
				ext. blkhd.	57	0.04	0.03	
				ext. ovrhd.	57	0.04	0.03	
01-85-0-L	6	0.32	0.25	01-98-0-L	35	0.03	0.03	
				01-98-0-L	35	0.03	0.03	
				01-98-0-L	35	0.03	0.03	
				01-94-2-L	35	0.03	0.03	
				01-89-2-L	35	0.03	0.03	
				not analyzed	35	0.03	0.03	
				02-63-0-Q	35	0.03	0.03	
				01-68-0-L	35	0.03	0.03	
				01-68-0-L	35	0.03	0.03	
				01-84-2-L	42	0.03	0.03	
02-48-0-C	6	0.45	0.54	ext. blkhd.	6	0.45	0.54	Opening
				3-47-0-C	11	0.05	0.06	
				ext. ovrhd.	11	0.05	0.06	
3-47-0-C	7	0.50	0.60	3-62-2-L	7	0.50	0.60	Zero-Str
				3-62-2-L	7	0.50	0.60	Zero-Str
				3-62-2-L	7	0.50	0.60	Zero-Str
				3-62-2-L	7	0.50	0.60	Zero-Str
				2-75-0-L	8	0.17	0.20	
				2-72-2-L	8	0.17	0.20	
				2-66-1-L	8	0.17	0.20	
				2-64-1-L	8	0.17	0.20	
				2-59-4-L	8	0.17	0.20	
				2-59-2-L	8	0.17	0.20	
				2-58-1-L	8	0.17	0.20	
				2-58-1	8	0.17	0.20	

				2-56-0-L	8	0.17	0.20	
				2-47-1-C	8	0.17	0.20	
				2-47-0-L	8	0.17	0.20	
				3-77-0-W	11	0.09	0.10	
				3-26A-0-A	11	0.09	0.10	
				ext. blkhd.	11	0.09	0.10	
				ext. blkhd.	11	0.09	0.10	
				02-48-0-C	19	0.05	0.06	
3-62-2-L	1	0.12	0.01	2-64-2-L	1	0.12	0.01	Zero-Str

---------Room of Origin----------				-------Barrier to Adjacent Room-------				
Plan ID	FRI Time	P(Loss) |EB	RFL|FFS (x 1000)	Adj. Room Plan ID	Fail Time	P(Loss) |EB	RFL|FFS (x 1000)	Opening/ Zero-Str
				3-47-0-C	1	0.12	0.01	Zero-Str
				3-47-0-C	1	0.12	0.01	Zero-Str
				3-47-0-C	1	0.12	0.01	Zero-Str
				3-47-0-C	1	0.12	0.01	Zero-Str
				2-56-0-L	25	0.01	0.00	
3-82-0-E	2	0.53	1.53	3-94-1-L	2	0.53	1.53	Zero-Str
				3-94-1-L	2	0.53	1.53	Zero-Str
				3-94-1-L	2	0.53	1.53	Zero-Str
				3-94-1-L	2	0.53	1.53	Zero-Str
				2-95-1-L	2	0.53	1.53	Zero-Str
				2-82-0-E	3	0.23	0.66	
				3-77-0-W	3	0.23	0.66	
				ext. blkhd.	3	0.23	0.66	
				ext. blkhd.	3	0.23	0.66	
				3-103-0-E	5	0.07	0.20	
3-94-1-L	1	0.12	0.01	2-82-0-E	1	0.12	0.01	Zero-Str
				3-82-0-E	1	0.12	0.01	Zero-Str
				3-82-0-E	1	0.12	0.01	Zero-Str
				3-82-0-E	1	0.12	0.01	Zero-Str
				3-82-0-E	1	0.12	0.01	Zero-Str
3-103-0-E	3	0.50	13.71	3-152A-0-E	3	0.50	13.71	Zero-Str
				ext. blkhd.	6	0.09	2.35	
				ext. blkhd.	6	0.09	2.35	
				3-152-2-E	6	0.09	2.35	
				3-152-0-E	6	0.09	2.35	
				2-82-0-E	6	0.09	2.35	
				ext. blkhd.	6	0.09	2.35	
				ext. blkhd.	6	0.09	2.35	
				3-82-0-E	6	0.09	2.35	
				ext. blkhd.	6	0.09	2.35	
				ext. blkhd.	6	0.09	2.35	
3-152A-0-E	2	0.53	14.32	3-103-0-E	2	0.53	14.32	Zero-Str
				3-160-2-L	2	0.39	10.54	
				3-152-2-E	2	0.39	10.54	
				3-152-0-E	2	0.39	10.54	
				not analyzed	3	0.23	6.33	
				3-165-1-Q	3	0.23	6.33	
				not analyzed	3	0.23	6.33	
				ext. blkhd.	3	0.23	6.33	
				ext. blkhd.	3	0.23	6.33	
2-47-0-L	7	0.36	0.29	2-59-4-L	11	0.16	0.13	
				2-59-2-L	11	0.16	0.13	
2-47-1-C	4	0.28	0.33	2-58-1-L	35	0.03	0.04	
				2-58-1-L	35	0.03	0.04	
				2-58-1	35	0.03	0.04	

				2-56-0-L	35	0.03	0.04	
				2-47-0-L	35	0.03	0.04	
				2-40-1-Q	35	0.03	0.04	
				ext. blkhd.	35	0.03	0.04	
2-59-4-L	3	0.37	0.33	2-72-2-L	4	0.17	0.15	
				2-47-0-L	8	0.17	0.15	
				2-59-2-L	25	0.04	0.03	
				ext. blkhd.	25	0.04	0.03	
				ext. blkhd.	25	0.04	0.03	
				ext. blkhd.	25	0.04	0.03	

---------Room of Origin----------				-------Barrier to Adjacent Room-------				
Plan ID	FRI Time	P(Loss) |EB	RFL|FFS (x 1000)	Adj. Room Plan ID	Fail Time	P(Loss) |EB	RFL|FFS (x 1000)	Opening/ Zero-Str
2-64-2-L	1	0.12	0.01	2-56-0-L	1	0.12	0.01	Zero-Str
				2-56-0-L	1	0.12	0.01	Zero-Str
				2-56-0-L	1	0.12	0.01	Zero-Str
				2-56-0-L	1	0.12	0.01	Zero-Str
				3-62-2-L	1	0.12	0.01	Zero-Str
2-66-1-L	10	0.35	0.28	ext. blkhd.	53	0.04	0.03	
				2-82-0-E	53	0.04	0.03	
				2-80-1-Q	53	0.04	0.03	
				2-75-0-L	53	0.04	0.03	
				2-64-1-L	53	0.04	0.03	
				2-64-1-L	53	0.04	0.03	
				2-58-1-L	53	0.04	0.03	
				2-56-0-L	53	0.04	0.03	
				ext. blkhd.	53	0.04	0.03	
				ext. blkhd.	53	0.04	0.03	
				ext. blkhd.	53	0.04	0.03	
2-72-2-L	1	0.48	0.38	2-75-0-L	3	0.22	0.17	
				2-75-0-L	3	0.22	0.17	
				2-75-0-L	3	0.22	0.17	
				2-75-0-L	3	0.22	0.17	
				2-59-4-L	3	0.22	0.17	
				2-59-2-L	3	0.22	0.17	
				2-82-0-E	35	0.05	0.04	
				2-80-1-Q	35	0.05	0.04	
				2-56-0-L	35	0.05	0.04	
				2-56-0-L	35	0.05	0.04	
				ext. blkhd.	35	0.05	0.04	
				ext. blkhd.	35	0.05	0.04	
				ext. blkhd.	35	0.05	0.04	
2-80-1-Q	1	0.32	0.32	2-82-0-E	3	0.04	0.04	
				2-75-0-L	3	0.04	0.04	
				2-72-2-L	3	0.04	0.04	
				3-77-0-W	28	0.03	0.03	
				2-66-1-L	9	0.03	0.03	
2-82-0-E	2	0.50	1.46	2-95-1-L	2	0.50	1.46	Zero-Str
				2-95-1-L	2	0.50	1.46	Zero-Str
				2-95-1-L	2	0.50	1.46	Zero-Str
				2-95-1-L	2	0.50	1.46	Zero-Str
				3-94-1-L	2	0.50	1.46	Zero-Str
				3-103-0-E	5	0.11	0.31	
				2-66-1-L	5	0.11	0.31	
				ext. blkhd.	2	0.07	0.19	

				ext. blkhd.	2	0.07	0.19	
				2-80-1-Q	2	0.07	0.19	
				2-72-2-L	2	0.07	0.19	
				ext. blkhd.	2	0.07	0.19	
				ext. blkhd.	2	0.07	0.19	
2-95-1-L	1	0.12	0.01	2-82-0-E	1	0.12	0.01	Zero-Str
				2-82-0-E	1	0.12	0.01	Zero-Str
				2-82-0-E	1	0.12	0.01	Zero-Str
				2-82-0-E	1	0.12	0.01	Zero-Str
				3-82-0-E	1	0.12	0.01	Zero-Str
2-165-2-L	2	0.43	0.34	2-165-0-L	3	0.19	0.16	
				2-175-0-L	23	0.04	0.03	
				2-175-0-L	23	0.04	0.03	

---------Room of Origin----------				-------Barrier to Adjacent Room-------				
Plan ID	FRI Time	P(Loss) |EB	RFL|FFS (x 1000)	Adj. Room Plan ID	Fail Time	P(Loss) |EB	RFL|FFS (x 1000)	Opening/ Zero-Str
				2-165-0-L	23	0.04	0.03	
				3-160-2-L	23	0.04	0.03	
				3-152-2-E	23	0.04	0.03	
				ext. blkhd.	23	0.04	0.03	
2-165-3-L	10	0.35	0.28	2-165-0-L	14	0.16	0.13	
2-175-0-L	2	0.41	0.37	2-178-1-L	2	0.41	0.37	Zero-Str
				2-178-1-L	2	0.41	0.37	Zero-Str
				2-178-1-L	2	0.41	0.37	Zero-Str
				2-178-1-L	2	0.41	0.37	Zero-Str
				2-186-2-Q	10	0.05	0.05	
				2-186-0-L	10	0.05	0.05	
				2-165-2-L	10	0.05	0.05	
				2-165-2-L	10	0.05	0.05	
				2-165-0-L	10	0.05	0.05	
				ext. blkhd.	10	0.05	0.05	
				2-186-4-L	29	0.04	0.04	
				2-165-3-L	29	0.04	0.04	
				2-165-3-L	29	0.04	0.04	
2-178-1-L	13	0.06	0.00	2-175-0-L	13	0.06	0.00	Zero-Str
				2-175-0-L	13	0.06	0.00	Zero-Str
				2-175-0-L	13	0.06	0.00	Zero-Str
				2-175-0-L	13	0.06	0.00	Zero-Str
2-186-1-L	3	0.38	0.30	2-194-0-L	21	0.04	0.04	
				2-194-0-L	21	0.04	0.04	
				2-194-0-L	21	0.04	0.04	
				2-186-0-L	21	0.04	0.04	
				ext. blkhd.	21	0.04	0.04	
				ext. blkhd.	21	0.04	0.04	
2-186-4-L	4	0.42	0.34	2-186-2-Q	9	0.19	0.15	
				2-186-2-Q	9	0.19	0.15	
2-194-0-L	2	0.41	0.37	2-199-1-L	2	0.41	0.37	Zero-Str
				2-199-1-L	2	0.41	0.37	Zero-Str
				2-199-1-L	2	0.41	0.37	Zero-Str
				2-199-1-L	8	0.06	0.06	
				2-207A-0-A	10	0.05	0.05	
				2-207A-0-A	10	0.05	0.05	
				2-207-1-Q	10	0.05	0.05	
				2-186-1-L	10	0.05	0.05	
				2-186-1-L	10	0.05	0.05	

				2-186-1-L	10	0.05	0.05	
				2-186-0-L	10	0.05	0.05	
				ext. blkhd.	10	0.05	0.05	
				ext. blkhd.	10	0.05	0.05	
				ext. blkhd.	10	0.05	0.05	
				2-186-4-L	29	0.04	0.04	
2-207A-0-A	4	0.40	0.36	2-210-1-L	4	0.40	0.36	Zero-Str
				ext. blkhd.	18	0.05	0.04	
				ext. blkhd.	18	0.05	0.04	
				ext. blkhd.	18	0.05	0.04	
				ext. blkhd.	18	0.05	0.04	
				3-228-0-E	18	0.05	0.04	
				2-221-1-Q	18	0.05	0.04	
				2-221-1-Q	18	0.05	0.04	
				not analyzed	18	0.05	0.04	
				not analyzed	18	0.05	0.04	

---------Room of Origin----------				-------Barrier to Adjacent Room-------				
Plan ID	FRI Time	P(Loss) |EB	RFL|FFS (x 1000)	Adj. Room Plan ID	Fail Time	P(Loss) |EB	RFL|FFS (x 1000)	Opening/ Zero-Str
				not analyzed	18	0.05	0.04	
				not analyzed	18	0.05	0.04	
				2-207-1-Q	18	0.05	0.04	
				2-207-1-Q	18	0.05	0.04	
				2-207-1-Q	18	0.05	0.04	
				2-207-1-Q	18	0.05	0.04	
				2-207-1-Q	18	0.05	0.04	
				2-194-0-L	18	0.05	0.04	
				2-194-0-L	18	0.05	0.04	
				ext. blkhd.	18	0.05	0.04	
				ext. blkhd.	18	0.05	0.04	
				ext. blkhd.	18	0.05	0.04	
				2-186-4-L	50	0.04	0.04	
3-228-0-E	2	0.24	0.70	2-221-1-Q	36	0.03	0.07	
				2-207A-0-A	36	0.03	0.07	
				ext. blkhd.	36	0.03	0.07	
				ext. blkhd.	36	0.03	0.07	
				ext. blkhd.	36	0.03	0.07	

SPENCER
08/04/98
MODEL RUN 17-98

PATH OPTION - SUMMARY LEVEL REPORT

LISTING OF ALL PATHS FROM 2-82-0-E

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

****

PATHS FROM 2-82-0-E					CUM L
1.	2-66-1-L				0.7587
2.	3-103-0-E	3-152-0-E			0.7933
3.	3-103-0-E	3-152-2-E	3-160-2-L		0.9845
4.	3-103-0-E	3-152A-0-E	3-165-1-Q		0.9103
5.	3-103-0-E	3-152A-0-E	3-152-0-E		0.8516
6.	3-103-0-E	3-152A-0-E	3-152-2-E	3-160-2-L	0.9889
7.	3-103-0-E	3-152A-0-E	3-160-2-L		0.9464
8.	3-94-1-L	3-82-0-E	3-103-0-E	3-152-0-E	0.9704
9.	3-94-1-L	3-82-0-E	3-103-0-E	3-152-2-E	0.9711
10.	3-94-1-L	3-82-0-E	3-103-0-E	3-152A-0-E	
	3-165-1-Q				0.9871
11.	3-94-1-L	3-82-0-E	3-103-0-E	3-152A-0-E	
	3-152-0-E				0.9787
12.	3-94-1-L	3-82-0-E	3-103-0-E	3-152A-0-E	
	3-152-2-E				0.9792
13.	2-72-2-L	2-59-2-L			0.9762
14.	2-72-2-L	2-59-4-L	2-47-0-L		0.9093
15.	2-72-2-L	2-75-0-L			0.9762
16.	2-80-1-Q				0.7006
17.	2-80-1-Q	2-66-1-L			0.9038
18.	2-80-1-Q	2-75-0-L			0.9792
19.	2-80-1-Q	2-72-2-L	2-59-2-L		0.9859
20.	2-80-1-Q	2-72-2-L	2-59-4-L	2-47-0-L	0.9461
21.	2-80-1-Q	2-72-2-L	2-75-0-L		0.9859
22.	2-95-1-L	3-82-0-E	3-103-0-E	3-152-0-E	0.9713
23.	2-95-1-L	3-82-0-E	3-103-0-E	3-152-2-E	0.9720
24.	2-95-1-L	3-82-0-E	3-103-0-E	3-152A-0-E	
	3-165-1-Q				0.9875
25.	2-95-1-L	3-82-0-E	3-103-0-E	3-152A-0-E	
	3-152-0-E				0.9794
26.	2-95-1-L	3-82-0-E	3-103-0-E	3-152A-0-E	
	3-152-2-E				0.9799

SPENCER
08/04/98
MODEL RUN 17-98

PATH OPTION - DETAIL LEVEL REPORT

INFORMATION ON ALL PATHS FROM 2-82-0-E

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

****

Path no. 1 Path Length 2

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-66-1-L	0.7587	therm	5	78.1	0.904	0.521	15	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-66-1-L	N/A	0.00	1.00	0.0000	23	dur

****

Path no. 2 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
3-103-0-E	0.6494	therm	5	2.2	0.548	0.304	8	36
3-152-0-E	0.7933	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	14	dur
3-103-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	29	dur

****

Path no. 3 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
3-103-0-E	0.6494	therm	5	2.2	0.548	0.304	8	36
3-152-2-E	0.7984	dur	9	159.4	0.713	0.425	23	
3-160-2-L	0.9845	dur	9	71.6	0.923	0.787	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	14	dur
3-103-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	32	dur
3-152-2-E/3-160-2-L	6.1	1.00	0.00	0.0000		therm

****

Path no. 4 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
3-103-0-E	0.6494	therm	5	2.2	0.548	0.304	8	36
3-152A-0-E	0.7484	dur	8	0.0	0.516	0.282	9	18
3-165-1-Q	0.9103	dur	10	82.1	1.000	0.644	26	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	14	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-165-1-Q	N/A	0.00	1.00	0.0000	19	dur

****

Path no. 5 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
3-103-0-E	0.6494	therm	5	2.2	0.548	0.304	8	36
3-152A-0-E	0.7484	dur	8	0.0	0.516	0.282	9	18
3-152-0-E	0.8516	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	14	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 6 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
3-103-0-E	0.6494	therm	5	2.2	0.548	0.304	8	36
3-152A-0-E	0.7484	dur	8	0.0	0.516	0.282	9	18
3-152-2-E	0.8553	dur	9	159.4	0.713	0.425	23	
3-160-2-L	0.9889	dur	9	71.6	0.923	0.787	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	14	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	17	dur
3-152-2-E/3-160-2-L	6.1	1.00	0.00	0.0000		therm

****

Path no. 7 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
3-103-0-E	0.6494	therm	5	2.2	0.548	0.304	8	36
3-152A-0-E	0.7484	dur	8	0.0	0.516	0.282	9	18
3-160-2-L	0.9464	dur	9	71.6	0.923	0.787	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	14	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-160-2-L	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 8 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
3-94-1-L	0.8924	dur	2	5.5	0.875	0.787	3	
3-82-0-E	0.9277	dur	3	0.3	0.474	0.328	4	28
3-103-0-E	0.9497	therm	5	2.2	0.548	0.304	8	36
3-152-0-E	0.9704	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/3-82-0-E	N/A	0.00	1.00	0.0000	3	dur
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	16	dur
3-103-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	29	dur

****

Path no. 9 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
3-94-1-L	0.8924	dur	2	5.5	0.875	0.787	3	
3-82-0-E	0.9277	dur	3	0.3	0.474	0.328	4	28
3-103-0-E	0.9497	therm	5	2.2	0.548	0.304	8	36
3-152-2-E	0.9711	dur	9	159.4	0.713	0.425	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/3-82-0-E	N/A	0.00	1.00	0.0000	3	dur
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	16	dur
3-103-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	32	dur

****

Path no. 10 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
3-94-1-L	0.8924	dur	2	5.5	0.875	0.787	3	
3-82-0-E	0.9277	dur	3	0.3	0.474	0.328	4	28
3-103-0-E	0.9497	therm	5	2.2	0.548	0.304	8	36
3-152A-0-E	0.9639	dur	8	0.0	0.516	0.282	9	18
3-165-1-Q	0.9871	dur	10	82.1	1.000	0.644	26	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/3-82-0-E	N/A	0.00	1.00	0.0000	3	dur
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	16	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-165-1-Q	N/A	0.00	1.00	0.0000	19	dur

****

Path no. 11 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
3-94-1-L	0.8924	dur	2	5.5	0.875	0.787	3	
3-82-0-E	0.9277	dur	3	0.3	0.474	0.328	4	28
3-103-0-E	0.9497	therm	5	2.2	0.548	0.304	8	36
3-152A-0-E	0.9639	dur	8	0.0	0.516	0.282	9	18
3-152-0-E	0.9787	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/3-82-0-E	N/A	0.00	1.00	0.0000	3	dur
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	16	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 12 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
3-94-1-L	0.8924	dur	2	5.5	0.875	0.787	3	
3-82-0-E	0.9277	dur	3	0.3	0.474	0.328	4	28
3-103-0-E	0.9497	therm	5	2.2	0.548	0.304	8	36
3-152A-0-E	0.9639	dur	8	0.0	0.516	0.282	9	18
3-152-2-E	0.9792	dur	9	159.4	0.713	0.425	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/3-82-0-E	N/A	0.00	1.00	0.0000	3	dur
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	16	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 13 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-72-2-L	0.6578	therm	2	62.7	0.577	0.321	3	
2-59-2-L	0.9762	therm	5	3.0	0.930	0.805		

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-72-2-L	N/A	0.00	1.00	0.0000	15	dur
2-72-2-L/2-59-2-L	N/A	1.00	0.00	0.0000		therm

****

Path no. 14 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-72-2-L	0.6578	therm	2	62.7	0.577	0.321	3	
2-59-4-L	0.8135	therm	5	45.9	0.756	0.455	8	
2-47-0-L	0.9093	therm	13	65.0	0.880	0.514	20	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-72-2-L	N/A	0.00	1.00	0.0000	15	dur
2-72-2-L/2-59-4-L	N/A	0.00	1.00	0.0000	25	dur
2-59-4-L/2-47-0-L	N/A	0.00	1.00	0.0000	33	dur

****

Path no. 15 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-72-2-L	0.6578	therm	2	62.7	0.577	0.321	3	
2-75-0-L	0.9762	therm	5	9.0	0.930	0.805		

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-72-2-L	N/A	0.00	1.00	0.0000	15	dur
2-72-2-L/2-75-0-L	N/A	1.00	0.00	0.0000		therm

****

Path no. 16 Path Length 2

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-80-1-Q	0.7006	therm	2	195.8	0.835	0.406	3	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	12	dur

****

Path no. 17 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-80-1-Q	0.7006	therm	2	195.8	0.835	0.406	3	
2-66-1-L	0.9038	therm	5	78.1	0.904	0.521	15	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	12	dur
2-80-1-Q/2-66-1-L	N/A	0.41	0.59	0.0000	48	dur

****

Path no. 18 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-80-1-Q	0.7006	therm	2	195.8	0.835	0.406	3	
2-75-0-L	0.9792	therm	5	9.0	0.930	0.805		

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	12	dur
2-80-1-Q/2-75-0-L	N/A	1.00	0.00	0.0000		therm

****

Path no. 19 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-80-1-Q	0.7006	therm	2	195.8	0.835	0.406	3	
2-72-2-L	0.7967	therm	2	62.7	0.577	0.321	3	
2-59-2-L	0.9859	therm	5	3.0	0.930	0.805		

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	12	dur
2-80-1-Q/2-72-2-L	N/A	0.00	1.00	0.0000	39	dur
2-72-2-L/2-59-2-L	N/A	1.00	0.00	0.0000		therm

****

Path no. 20 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-80-1-Q	0.7006	therm	2	195.8	0.835	0.406	3	
2-72-2-L	0.7967	therm	2	62.7	0.577	0.321	3	
2-59-4-L	0.8892	therm	5	45.9	0.756	0.455	8	
2-47-0-L	0.9461	therm	13	65.0	0.880	0.514	20	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	12	dur
2-80-1-Q/2-72-2-L	N/A	0.00	1.00	0.0000	39	dur
2-72-2-L/2-59-4-L	N/A	0.00	1.00	0.0000	25	dur
2-59-4-L/2-47-0-L	N/A	0.00	1.00	0.0000	33	dur

****

Path no. 21 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-80-1-Q	0.7006	therm	2	195.8	0.835	0.406	3	
2-72-2-L	0.7967	therm	2	62.7	0.577	0.321	3	
2-75-0-L	0.9859	therm	5	9.0	0.930	0.805		

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	12	dur
2-80-1-Q/2-72-2-L	N/A	0.00	1.00	0.0000	39	dur
2-72-2-L/2-75-0-L	N/A	1.00	0.00	0.0000		therm

****

Path no. 22 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-95-1-L	0.8958	dur	2	26.6	0.879	0.793	3	
3-82-0-E	0.9300	dur	3	0.3	0.474	0.328	4	28
3-103-0-E	0.9513	therm	5	2.2	0.548	0.304	8	36
3-152-0-E	0.9713	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/3-82-0-E	N/A	0.00	1.00	0.0000	3	dur
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	16	dur
3-103-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	29	dur

****

Path no. 23 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-95-1-L	0.8958	dur	2	26.6	0.879	0.793	3	
3-82-0-E	0.9300	dur	3	0.3	0.474	0.328	4	28
3-103-0-E	0.9513	therm	5	2.2	0.548	0.304	8	36
3-152-2-E	0.9720	dur	9	159.4	0.713	0.425	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/3-82-0-E	N/A	0.00	1.00	0.0000	3	dur
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	16	dur
3-103-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	32	dur

****

Path no. 24 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-95-1-L	0.8958	dur	2	26.6	0.879	0.793	3	
3-82-0-E	0.9300	dur	3	0.3	0.474	0.328	4	28
3-103-0-E	0.9513	therm	5	2.2	0.548	0.304	8	36
3-152A-0-E	0.9650	dur	8	0.0	0.516	0.282	9	18
3-165-1-Q	0.9875	dur	10	82.1	1.000	0.644	26	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/3-82-0-E	N/A	0.00	1.00	0.0000	3	dur
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	16	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-165-1-Q	N/A	0.00	1.00	0.0000	19	dur

****

Path no. 25 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-95-1-L	0.8958	dur	2	26.6	0.879	0.793	3	
3-82-0-E	0.9300	dur	3	0.3	0.474	0.328	4	28
3-103-0-E	0.9513	therm	5	2.2	0.548	0.304	8	36
3-152A-0-E	0.9650	dur	8	0.0	0.516	0.282	9	18
3-152-0-E	0.9794	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/3-82-0-E	N/A	0.00	1.00	0.0000	3	dur
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	16	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 26 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
2-82-0-E	0.4960	orig	0	0.0	N/A	N/A	2	28
2-95-1-L	0.8958	dur	2	26.6	0.879	0.793	3	
3-82-0-E	0.9300	dur	3	0.3	0.474	0.328	4	28
3-103-0-E	0.9513	therm	5	2.2	0.548	0.304	8	36
3-152A-0-E	0.9650	dur	8	0.0	0.516	0.282	9	18
3-152-2-E	0.9799	dur	9	159.4	0.713	0.425	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
2-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/3-82-0-E	N/A	0.00	1.00	0.0000	3	dur
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	16	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	17	dur

SPENCER
08/04/98
MODEL RUN 17-99

PATH OPTION - SUMMARY LEVEL REPORT

LISTING OF ALL PATHS FROM 3-82-0-E

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

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PATHS FROM 3-82-0-E					CUM L
1.	3-103-0-E	3-152-0-E			0.7841
2.	3-103-0-E	3-152-2-E	3-160-2-L		0.9838
3.	3-103-0-E	3-152A-0-E	3-165-1-Q		0.9063
4.	3-103-0-E	3-152A-0-E	3-152-0-E		0.8450
5.	3-103-0-E	3-152A-0-E	3-152-2-E	3-160-2-L	0.9884
6.	3-103-0-E	3-152A-0-E	3-160-2-L		0.9440
7.	2-82-0-E	2-66-1-L			0.8359
8.	2-82-0-E	3-103-0-E	3-152-0-E		0.8595
9.	2-82-0-E	3-103-0-E	3-152-2-E	3-160-2-L	0.9895
10.	2-82-0-E	3-103-0-E	3-152A-0-E	3-165-1-Q	0.9390
11.	2-82-0-E	3-103-0-E	3-152A-0-E	3-152-0-E	0.8991
12.	2-82-0-E	3-103-0-E	3-152A-0-E	3-152-2-E	0.9016
13.	2-82-0-E	3-103-0-E	3-152A-0-E	3-160-2-L	0.9636
14.	2-82-0-E	2-72-2-L	2-59-2-L		0.9838
15.	2-82-0-E	2-72-2-L	2-59-4-L	2-47-0-L	0.9383
16.	2-82-0-E	2-72-2-L	2-75-0-L		0.9838
17.	2-82-0-E	2-80-1-Q			0.7964
18.	2-82-0-E	2-80-1-Q	2-66-1-L		0.9428
19.	2-82-0-E	2-80-1-Q	2-75-0-L		0.9858
20.	2-82-0-E	2-80-1-Q	2-72-2-L	2-59-4-L 2-47-0-L	0.9634
21.	2-95-1-L	2-82-0-E	2-66-1-L		0.9661
22.	2-95-1-L	2-82-0-E	3-103-0-E	3-152-0-E	0.9709
23.	2-95-1-L	2-82-0-E	3-103-0-E	3-152-2-E	0.9717
24.	2-95-1-L	2-82-0-E	3-103-0-E	3-152A-0-E 3-165-1-Q	0.9874
25.	2-95-1-L	2-82-0-E	3-103-0-E	3-152A-0-E 3-152-0-E	0.9791
26.	2-95-1-L	2-82-0-E	3-103-0-E	3-152A-0-E 3-152-2-E	0.9797
27.	2-95-1-L	2-82-0-E	2-72-2-L	2-59-4-L 2-47-0-L	0.9872
28.	2-95-1-L	2-82-0-E	2-80-1-Q		0.9579
29.	2-95-1-L	2-82-0-E	2-80-1-Q	2-66-1-L	0.9882
30.	2-95-1-L	2-82-0-E	2-80-1-Q	2-72-2-L 2-59-4-L	0.9844
31.	3-94-1-L	2-82-0-E	2-66-1-L		0.9650
32.	3-94-1-L	2-82-0-E	3-103-0-E	3-152-0-E	0.9700
33.	3-94-1-L	2-82-0-E	3-103-0-E	3-152-2-E	0.9707
34.	3-94-1-L	2-82-0-E	3-103-0-E	3-152A-0-E 3-165-1-Q	0.9870
35.	3-94-1-L	2-82-0-E	3-103-0-E	3-152A-0-E	

	3-152-0-E				0.9785
36.	3-94-1-L	2-82-0-E	3-103-0-E	3-152A-0-E	
	3-152-2-E				0.9790
37.	3-94-1-L	2-82-0-E	2-72-2-L	2-59-4-L	
	2-47-0-L				0.9868
38.	3-94-1-L	2-82-0-E	2-80-1-Q		0.9566
39.	3-94-1-L	2-82-0-E	2-80-1-Q	2-66-1-L	0.9878
40.	3-94-1-L	2-82-0-E	2-80-1-Q	2-72-2-L	
	2-59-4-L				0.9839

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08/04/98
MODEL RUN 17-99

PATH OPTION - DETAIL LEVEL REPORT

INFORMATION ON ALL PATHS FROM 3-82-0-E

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

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Path no. 1 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-103-0-E	0.6338	therm	5	2.2	0.548	0.304	8	43
3-152-0-E	0.7841	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	29	dur

****

Path no. 2 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-103-0-E	0.6338	therm	5	2.2	0.548	0.304	8	43
3-152-2-E	0.7894	dur	9	159.4	0.713	0.425	23	
3-160-2-L	0.9838	dur	9	71.6	0.923	0.787	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	32	dur
3-152-2-E/3-160-2-L	6.1	1.00	0.00	0.0000		therm

****

Path no. 3 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-103-0-E	0.6338	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.7372	dur	8	0.0	0.516	0.282	9	18
3-165-1-Q	0.9063	dur	10	82.1	1.000	0.644	26	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-165-1-Q	N/A	0.00	1.00	0.0000	19	dur

****

Path no. 4 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-103-0-E	0.6338	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.7372	dur	8	0.0	0.516	0.282	9	18
3-152-0-E	0.8450	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 5 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-103-0-E	0.6338	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.7372	dur	8	0.0	0.516	0.282	9	18
3-152-2-E	0.8488	dur	9	159.4	0.713	0.425	23	
3-160-2-L	0.9884	dur	9	71.6	0.923	0.787	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	17	dur
3-152-2-E/3-160-2-L	6.1	1.00	0.00	0.0000		therm

****

Path no. 6 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-103-0-E	0.6338	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.7372	dur	8	0.0	0.516	0.282	9	18
3-160-2-L	0.9440	dur	9	71.6	0.923	0.787	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-160-2-L	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 7 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
2-66-1-L	0.8359	therm	7	78.5	0.904	0.521	17	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/2-66-1-L	N/A	0.00	1.00	0.0000	25	dur

****

Path no. 8 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.7616	therm	5	2.2	0.548	0.304	8	43
3-152-0-E	0.8595	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	29	dur

****

Path no. 9 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.7616	therm	5	2.2	0.548	0.304	8	43
3-152-2-E	0.8629	dur	9	159.4	0.713	0.425	23	
3-160-2-L	0.9895	dur	9	71.6	0.923	0.787	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	32	dur
3-152-2-E/3-160-2-L	6.1	1.00	0.00	0.0000		therm

****

Path no. 10 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.7616	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.8289	dur	8	0.0	0.516	0.282	9	18
3-165-1-Q	0.9390	dur	10	82.1	1.000	0.644	26	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-165-1-Q	N/A	0.00	1.00	0.0000	19	dur

****

Path no. 11 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.7616	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.8289	dur	8	0.0	0.516	0.282	9	18
3-152-0-E	0.8991	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	17	dur

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Path no. 12 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.7616	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.8289	dur	8	0.0	0.516	0.282	9	18
3-152-2-E	0.9016	dur	9	159.4	0.713	0.425	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 13 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.7616	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.8289	dur	8	0.0	0.516	0.282	9	18
3-160-2-L	0.9636	dur	9	71.6	0.923	0.787	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-160-2-L	N/A	0.00	1.00	0.0000	17	dur

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Path no. 14 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
2-72-2-L	0.7673	therm	4	62.8	0.577	0.321	5	
2-59-2-L	0.9838	therm	7	3.0	0.930	0.805		

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/2-72-2-L	N/A	0.00	1.00	0.0000	17	dur
2-72-2-L/2-59-2-L	N/A	1.00	0.00	0.0000		therm

****

Path no. 15 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
2-72-2-L	0.7673	therm	4	62.8	0.577	0.321	5	
2-59-4-L	0.8732	therm	7	46.1	0.756	0.455	10	
2-47-0-L	0.9383	therm	15	65.2	0.880	0.514	22	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/2-72-2-L	N/A	0.00	1.00	0.0000	17	dur
2-72-2-L/2-59-4-L	N/A	0.00	1.00	0.0000	27	dur
2-59-4-L/2-47-0-L	N/A	0.00	1.00	0.0000	35	dur

****

Path no. 16 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
2-72-2-L	0.7673	therm	4	62.8	0.577	0.321	5	
2-75-0-L	0.9838	therm	7	9.0	0.930	0.805		

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/2-72-2-L	N/A	0.00	1.00	0.0000	17	dur
2-72-2-L/2-75-0-L	N/A	1.00	0.00	0.0000		therm

****

Path no. 17 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
2-80-1-Q	0.7964	therm	4	169.6	0.835	0.406	5	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	14	dur

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Path no. 18 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
2-80-1-Q	0.7964	therm	4	169.6	0.835	0.406	5	
2-66-1-L	0.9428	therm	7	78.5	0.904	0.521	17	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	14	dur
2-80-1-Q/2-66-1-L	N/A	0.52	0.48	0.0000	50	dur

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Path no. 19 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
2-80-1-Q	0.7964	therm	4	169.6	0.835	0.406	5	
2-75-0-L	0.9858	therm	7	9.0	0.930	0.805		

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	14	dur
2-80-1-Q/2-75-0-L	N/A	1.00	0.00	0.0000		therm

****

Path no. 20 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-82-0-E	0.6573	dur	3	0.0	0.502	0.349	4	31
2-80-1-Q	0.7964	therm	4	169.6	0.835	0.406	5	
2-72-2-L	0.8618	therm	4	62.8	0.577	0.321	5	
2-59-4-L	0.9247	therm	7	46.1	0.756	0.455	10	
2-47-0-L	0.9634	therm	15	65.2	0.880	0.514	22	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	13	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	14	dur
2-80-1-Q/2-72-2-L	N/A	0.00	1.00	0.0000	41	dur
2-72-2-L/2-59-4-L	N/A	0.00	1.00	0.0000	27	dur
2-59-4-L/2-47-0-L	N/A	0.00	1.00	0.0000	35	dur

****

Path no. 21 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-95-1-L	0.8911	dur	2	10.0	0.879	0.793	3	
2-82-0-E	0.9291	dur	3	0.0	0.502	0.349	4	31
2-66-1-L	0.9661	therm	7	78.5	0.904	0.521	17	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/2-66-1-L	N/A	0.00	1.00	0.0000	25	dur

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Path no. 22 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-95-1-L	0.8911	dur	2	10.0	0.879	0.793	3	
2-82-0-E	0.9291	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.9507	therm	5	2.2	0.548	0.304	8	43
3-152-0-E	0.9709	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	29	dur

****

Path no. 23 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-95-1-L	0.8911	dur	2	10.0	0.879	0.793	3	
2-82-0-E	0.9291	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.9507	therm	5	2.2	0.548	0.304	8	43
3-152-2-E	0.9717	dur	9	159.4	0.713	0.425	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	32	dur

****

Path no. 24 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-95-1-L	0.8911	dur	2	10.0	0.879	0.793	3	
2-82-0-E	0.9291	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.9507	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.9646	dur	8	0.0	0.516	0.282	9	18
3-165-1-Q	0.9874	dur	10	82.1	1.000	0.644	26	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-165-1-Q	N/A	0.00	1.00	0.0000	19	dur

****

Path no. 25 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-95-1-L	0.8911	dur	2	10.0	0.879	0.793	3	
2-82-0-E	0.9291	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.9507	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.9646	dur	8	0.0	0.516	0.282	9	18
3-152-0-E	0.9791	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 26 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-95-1-L	0.8911	dur	2	10.0	0.879	0.793	3	
2-82-0-E	0.9291	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.9507	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.9646	dur	8	0.0	0.516	0.282	9	18
3-152-2-E	0.9797	dur	9	159.4	0.713	0.425	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 27 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-95-1-L	0.8911	dur	2	10.0	0.879	0.793	3	
2-82-0-E	0.9291	dur	3	0.0	0.502	0.349	4	31
2-72-2-L	0.9519	therm	4	62.8	0.577	0.321	5	
2-59-4-L	0.9738	therm	7	46.1	0.756	0.455	10	
2-47-0-L	0.9872	therm	15	65.2	0.880	0.514	22	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/2-72-2-L	N/A	0.00	1.00	0.0000	17	dur
2-72-2-L/2-59-4-L	N/A	0.00	1.00	0.0000	27	dur
2-59-4-L/2-47-0-L	N/A	0.00	1.00	0.0000	35	dur

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Path no. 28 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-95-1-L	0.8911	dur	2	10.0	0.879	0.793	3	
2-82-0-E	0.9291	dur	3	0.0	0.502	0.349	4	31
2-80-1-Q	0.9579	therm	4	169.6	0.835	0.406	5	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	14	dur

****

Path no. 29 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-95-1-L	0.8911	dur	2	10.0	0.879	0.793	3	
2-82-0-E	0.9291	dur	3	0.0	0.502	0.349	4	31
2-80-1-Q	0.9579	therm	4	169.6	0.835	0.406	5	
2-66-1-L	0.9882	therm	7	78.5	0.904	0.521	17	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	14	dur
2-80-1-Q/2-66-1-L	N/A	0.52	0.48	0.0000	50	dur

****

Path no. 30 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
2-95-1-L	0.8911	dur	2	10.0	0.879	0.793	3	
2-82-0-E	0.9291	dur	3	0.0	0.502	0.349	4	31
2-80-1-Q	0.9579	therm	4	169.6	0.835	0.406	5	
2-72-2-L	0.9714	therm	4	62.8	0.577	0.321	5	
2-59-4-L	0.9844	therm	7	46.1	0.756	0.455	10	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	2	dur
2-95-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	14	dur
2-80-1-Q/2-72-2-L	N/A	0.00	1.00	0.0000	41	dur
2-72-2-L/2-59-4-L	N/A	0.00	1.00	0.0000	27	dur

****

Path no. 31 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-94-1-L	0.8877	dur	2	4.5	0.875	0.787	3	
2-82-0-E	0.9269	dur	3	0.0	0.502	0.349	4	31
2-66-1-L	0.9650	therm	7	78.5	0.904	0.521	17	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/2-66-1-L	N/A	0.00	1.00	0.0000	25	dur

****

Path no. 32 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-94-1-L	0.8877	dur	2	4.5	0.875	0.787	3	
2-82-0-E	0.9269	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.9491	therm	5	2.2	0.548	0.304	8	43
3-152-0-E	0.9700	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	29	dur

****

Path no. 33 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-94-1-L	0.8877	dur	2	4.5	0.875	0.787	3	
2-82-0-E	0.9269	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.9491	therm	5	2.2	0.548	0.304	8	43
3-152-2-E	0.9707	dur	9	159.4	0.713	0.425	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	32	dur

****

Path no. 34 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-94-1-L	0.8877	dur	2	4.5	0.875	0.787	3	
2-82-0-E	0.9269	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.9491	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.9635	dur	8	0.0	0.516	0.282	9	18
3-165-1-Q	0.9870	dur	10	82.1	1.000	0.644	26	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-165-1-Q	N/A	0.00	1.00	0.0000	19	dur

****

Path no. 35 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-94-1-L	0.8877	dur	2	4.5	0.875	0.787	3	
2-82-0-E	0.9269	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.9491	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.9635	dur	8	0.0	0.516	0.282	9	18
3-152-0-E	0.9785	therm	9	25.6	0.692	0.410	16	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 36 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-94-1-L	0.8877	dur	2	4.5	0.875	0.787	3	
2-82-0-E	0.9269	dur	3	0.0	0.502	0.349	4	31
3-103-0-E	0.9491	therm	5	2.2	0.548	0.304	8	43
3-152A-0-E	0.9635	dur	8	0.0	0.516	0.282	9	18
3-152-2-E	0.9790	dur	9	159.4	0.713	0.425	23	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/3-103-0-E	N/A	0.00	1.00	0.0000	15	dur
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	8	dur
3-152A-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	17	dur

****

Path no. 37 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-94-1-L	0.8877	dur	2	4.5	0.875	0.787	3	
2-82-0-E	0.9269	dur	3	0.0	0.502	0.349	4	31
2-72-2-L	0.9503	therm	4	62.8	0.577	0.321	5	
2-59-4-L	0.9729	therm	7	46.1	0.756	0.455	10	
2-47-0-L	0.9868	therm	15	65.2	0.880	0.514	22	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/2-72-2-L	N/A	0.00	1.00	0.0000	17	dur
2-72-2-L/2-59-4-L	N/A	0.00	1.00	0.0000	27	dur
2-59-4-L/2-47-0-L	N/A	0.00	1.00	0.0000	35	dur

****

Path no. 38 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-94-1-L	0.8877	dur	2	4.5	0.875	0.787	3	
2-82-0-E	0.9269	dur	3	0.0	0.502	0.349	4	31
2-80-1-Q	0.9566	therm	4	169.6	0.835	0.406	5	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	14	dur

****

Path no. 39 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-94-1-L	0.8877	dur	2	4.5	0.875	0.787	3	
2-82-0-E	0.9269	dur	3	0.0	0.502	0.349	4	31
2-80-1-Q	0.9566	therm	4	169.6	0.835	0.406	5	
2-66-1-L	0.9878	therm	7	78.5	0.904	0.521	17	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	14	dur
2-80-1-Q/2-66-1-L	N/A	0.52	0.48	0.0000	50	dur

****

Path no. 40 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-82-0-E	0.4736	orig	0	0.0	N/A	N/A	2	24
3-94-1-L	0.8877	dur	2	4.5	0.875	0.787	3	
2-82-0-E	0.9269	dur	3	0.0	0.502	0.349	4	31
2-80-1-Q	0.9566	therm	4	169.6	0.835	0.406	5	
2-72-2-L	0.9705	therm	4	62.8	0.577	0.321	5	
2-59-4-L	0.9839	therm	7	46.1	0.756	0.455	10	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	2	dur
3-94-1-L/2-82-0-E	N/A	0.00	1.00	0.0000	3	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	14	dur
2-80-1-Q/2-72-2-L	N/A	0.00	1.00	0.0000	41	dur
2-72-2-L/2-59-4-L	N/A	0.00	1.00	0.0000	27	dur

SPENCER
08/04/98
MODEL RUN 17-100

PATH OPTION - SUMMARY LEVEL REPORT

LISTING OF ALL PATHS FROM 3-103-0-E

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

****

PATHS FROM 3-103-0-E					CUM L
1.	3-82-0-E				0.6613
2.	3-82-0-E	2-95-1-L			0.9300
3.	3-82-0-E	3-94-1-L			0.9277
4.	2-82-0-E	2-66-1-L			0.8429
5.	2-82-0-E	3-94-1-L			0.9300
6.	2-82-0-E	2-72-2-L	2-59-2-L		0.9845
7.	2-82-0-E	2-72-2-L	2-59-4-L	2-47-0-L	0.9409
8.	2-82-0-E	2-72-2-L	2-75-0-L		0.9845
9.	2-82-0-E	2-80-1-Q			0.8051
10.	2-82-0-E	2-80-1-Q	2-66-1-L		0.9564
11.	2-82-0-E	2-80-1-Q	2-75-0-L		0.9864
12.	2-82-0-E	2-80-1-Q	2-72-2-L	2-59-4-L 2-47-0-L	0.9669
13.	2-82-0-E	2-95-1-L			0.9321
14.	3-152-0-E				0.7028
15.	3-152-2-E	2-165-2-L			0.9599
16.	3-152-2-E	3-160-2-L			0.9777
17.	3-152A-0-E	3-165-1-Q			0.8711
18.	3-152A-0-E	3-152-0-E			0.7867
19.	3-152A-0-E	3-152-2-E	2-165-2-L		0.9712
20.	3-152A-0-E	3-152-2-E	3-160-2-L		0.9840
21.	3-152A-0-E	3-160-2-L			0.9229

SPENCER
08/04/98
MODEL RUN 17-100

PATH OPTION - DETAIL LEVEL REPORT

INFORMATION ON ALL PATHS FROM 3-103-0-E

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

****

Path no. 1 Path Length 2

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
3-82-0-E	0.6613	therm	6	0.0	0.474	0.328	8	30

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/3-82-0-E	N/A	0.00	1.00	0.0000	15	dur

****

Path no. 2 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
3-82-0-E	0.6613	therm	6	0.0	0.474	0.328	8	30
2-95-1-L	0.9300	dur	8	31.5	0.879	0.793	9	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/3-82-0-E	N/A	0.00	1.00	0.0000	15	dur
3-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	8	dur

****

Path no. 3 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
3-82-0-E	0.6613	therm	6	0.0	0.474	0.328	8	30
3-94-1-L	0.9277	dur	8	5.7	0.875	0.787	9	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/3-82-0-E	N/A	0.00	1.00	0.0000	15	dur
3-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	8	dur

****

Path no. 4 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
2-82-0-E	0.6719	therm	6	0.1	0.502	0.349	8	34
2-66-1-L	0.8429	therm	11	79.3	0.904	0.521	21	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	15	dur
2-82-0-E/2-66-1-L	N/A	0.00	1.00	0.0000	29	dur

****

Path no. 5 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
2-82-0-E	0.6719	therm	6	0.1	0.502	0.349	8	34
3-94-1-L	0.9300	dur	8	5.7	0.875	0.787	9	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	15	dur
2-82-0-E/3-94-1-L	N/A	0.00	1.00	0.0000	8	dur

****

Path no. 6 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
2-82-0-E	0.6719	therm	6	0.1	0.502	0.349	8	34
2-72-2-L	0.7772	therm	8	63.1	0.577	0.321	9	
2-59-2-L	0.9845	therm	11	3.0	0.930	0.805		

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	15	dur
2-82-0-E/2-72-2-L	N/A	0.00	1.00	0.0000	21	dur
2-72-2-L/2-59-2-L	N/A	1.00	0.00	0.0000		therm

****

Path no. 7 Path Length 5

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
2-82-0-E	0.6719	therm	6	0.1	0.502	0.349	8	34
2-72-2-L	0.7772	therm	8	63.1	0.577	0.321	9	
2-59-4-L	0.8786	therm	11	46.6	0.756	0.455	14	
2-47-0-L	0.9409	therm	19	65.8	0.880	0.514	26	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	15	dur
2-82-0-E/2-72-2-L	N/A	0.00	1.00	0.0000	21	dur
2-72-2-L/2-59-4-L	N/A	0.00	1.00	0.0000	31	dur
2-59-4-L/2-47-0-L	N/A	0.00	1.00	0.0000	39	dur

****

Path no. 8 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
2-82-0-E	0.6719	therm	6	0.1	0.502	0.349	8	34
2-72-2-L	0.7772	therm	8	63.1	0.577	0.321	9	
2-75-0-L	0.9845	therm	11	9.0	0.930	0.805		

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	15	dur
2-82-0-E/2-72-2-L	N/A	0.00	1.00	0.0000	21	dur
2-72-2-L/2-75-0-L	N/A	1.00	0.00	0.0000		therm

****

Path no. 9 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
2-82-0-E	0.6719	therm	6	0.1	0.502	0.349	8	34
2-80-1-Q	0.8051	therm	8	201.4	0.835	0.406	9	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	15	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	18	dur

****

Path no. 10 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
2-82-0-E	0.6719	therm	6	0.1	0.502	0.349	8	34
2-80-1-Q	0.8051	therm	8	201.4	0.835	0.406	9	
2-66-1-L	0.9564	therm	11	79.3	0.904	0.521	21	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	15	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	18	dur
2-80-1-Q/2-66-1-L	N/A	0.67	0.33	0.0000	54	therm

****

Path no. 11 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
2-82-0-E	0.6719	therm	6	0.1	0.502	0.349	8	34
2-80-1-Q	0.8051	therm	8	201.4	0.835	0.406	9	
2-75-0-L	0.9864	therm	11	9.0	0.930	0.805		

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	15	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	18	dur
2-80-1-Q/2-75-0-L	N/A	1.00	0.00	0.0000		therm

****

Path no. 12 Path Length 6

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
2-82-0-E	0.6719	therm	6	0.1	0.502	0.349	8	34
2-80-1-Q	0.8051	therm	8	201.4	0.835	0.406	9	
2-72-2-L	0.8752	therm	8	63.1	0.577	0.321	9	
2-59-4-L	0.9320	therm	11	46.6	0.756	0.455	14	
2-47-0-L	0.9669	therm	19	65.8	0.880	0.514	26	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	15	dur
2-82-0-E/2-80-1-Q	N/A	0.00	1.00	0.0000	18	dur
2-80-1-Q/2-72-2-L	N/A	0.15	0.85	0.0000	45	dur
2-72-2-L/2-59-4-L	N/A	0.00	1.00	0.0000	31	dur
2-59-4-L/2-47-0-L	N/A	0.00	1.00	0.0000	39	dur

****

Path no. 13 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
2-82-0-E	0.6719	therm	6	0.1	0.502	0.349	8	34
2-95-1-L	0.9321	dur	8	31.5	0.879	0.793	9	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/2-82-0-E	N/A	0.00	1.00	0.0000	15	dur
2-82-0-E/2-95-1-L	N/A	0.00	1.00	0.0000	8	dur

****

Path no. 14 Path Length 2

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
3-152-0-E	0.7028	therm	4	25.5	0.692	0.410	11	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	24	dur

****

Path no. 15 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
3-152-2-E	0.7101	dur	4	159.1	0.713	0.425	18	
2-165-2-L	0.9599	therm	54	35.9	0.631	0.363	56	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	27	dur
3-152-2-E/2-165-2-L	4.4	0.38	0.00	0.1811		therm

****

Path no. 16 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
3-152-2-E	0.7101	dur	4	159.1	0.713	0.425	18	
3-160-2-L	0.9777	dur	4	71.4	0.923	0.787	18	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	27	dur
3-152-2-E/3-160-2-L	6.9	1.00	0.00	0.0000		therm

****

Path no. 17 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
3-152A-0-E	0.6382	dur	3	0.0	0.516	0.282	4	13
3-165-1-Q	0.8711	dur	5	82.1	1.000	0.644	21	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	3	dur
3-152A-0-E/3-165-1-Q	N/A	0.00	1.00	0.0000	14	dur

****

Path no. 18 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
3-152A-0-E	0.6382	dur	3	0.0	0.516	0.282	4	13
3-152-0-E	0.7867	therm	4	25.5	0.692	0.410	11	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	3	dur
3-152A-0-E/3-152-0-E	N/A	0.00	1.00	0.0000	12	dur

****

Path no. 19 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
3-152A-0-E	0.6382	dur	3	0.0	0.516	0.282	4	13
3-152-2-E	0.7919	dur	4	159.1	0.713	0.425	18	
2-165-2-L	0.9712	therm	54	35.9	0.631	0.363	56	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	3	dur
3-152A-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	12	dur
3-152-2-E/2-165-2-L	4.4	0.38	0.00	0.1300		therm

****

Path no. 20 Path Length 4

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
3-152A-0-E	0.6382	dur	3	0.0	0.516	0.282	4	13
3-152-2-E	0.7919	dur	4	159.1	0.713	0.425	18	
3-160-2-L	0.9840	dur	4	71.4	0.923	0.787	18	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	3	dur
3-152A-0-E/3-152-2-E	N/A	0.00	1.00	0.0000	12	dur
3-152-2-E/3-160-2-L	6.9	1.00	0.00	0.0000		therm

****

Path no. 21 Path Length 3

Compt ID	Cum L	Ign Mode	EB Time	Compt Fuel	Therm IAM	Dur IAM	FRI Time	CBO
3-103-0-E	0.4960	orig	0	2.2	N/A	N/A	3	38
3-152A-0-E	0.6382	dur	3	0.0	0.516	0.282	4	13
3-160-2-L	0.9229	dur	4	71.4	0.923	0.787	18	

Connecting Barrier	HEI	Tbar	Dbar	IBV	Time Destroyed	Failure Type
3-103-0-E/3-152A-0-E	N/A	0.00	1.00	0.0000	3	dur
3-152A-0-E/3-160-2-L	N/A	0.00	1.00	0.0000	12	dur

Appendix D
Analysis of Alternatives Data

The various output data produced in the analysis of alternatives on the 270' WMEC using SAFE, version 2.2, are documented in this appendix. The following index correlates SAFE output data for each alternative with page numbers in this appendix:

D.1 Analysis of Non-continuous Joiner Bulkheads

D.2 Analysis of Alternative Automated Systems in Auxiliary Machinery Spaces

D.2.1 Analysis of Alternative Automated Systems in 2-82-0-E

D.2.2 Analysis of Alternative Automated Systems in 3-82-0-E

D.2.3 Analysis of Alternative Automated Systems in 3-103-0-E

SPENCER
08/04/98
MODEL RUN 18-89

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . XRAY
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Non-Continuous Joiner Bulkheads

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0321	0.8341
2-82-0-E	2	26 years	0.0298	0.7747
3-103-0-E	2	26 years	0.0279	0.7241
3-152A-0-E	2	26 years	0.0271	0.7052
3-152-2-E	2	22 years	0.0311	0.6853
3-82-0-E	2	26 years	0.0181	0.4704
2-72-2-L	2	20 years	0.0211	0.4213
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0009	0.0230
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-207A-0-A	3	15 years	0.0008	0.0113
2-186-1-L	2	20 years	0.0005	0.0097
1-109-2	2	23 years	0.0004	0.0082
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0022
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 18-90

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . XRAY
CONFIGURATION . . . . Passive and Automatic
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Non-Continuous Joiner Bulkheads

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0413	1.0747
2-82-0-E	2	26 years	0.0369	0.9600
3-152-2-E	2	22 years	0.0432	0.9508
3-103-0-E	2	26 years	0.0320	0.8330
3-152A-0-E	2	26 years	0.0306	0.7950
3-82-0-E	2	26 years	0.0211	0.5493
2-72-2-L	2	20 years	0.0263	0.5258
2-165-2-L	2	20 years	0.0080	0.1602
1-117-0-L	2	24 years	0.0036	0.0865
1-117-2-L	2	24 years	0.0031	0.0741
1-129-2-Q	2	20 years	0.0027	0.0535
1-141-2-Q	2	26 years	0.0020	0.0516
1-201-1-Q	2	21 years	0.0022	0.0454
1-165-3-L	2	24 years	0.0014	0.0345
1-169-1-L	2	25 years	0.0014	0.0342
2-47-1-C	2	26 years	0.0012	0.0301
02-48-0-C	2	26 years	0.0011	0.0299
3-47-0-C	2	26 years	0.0011	0.0288
3-228-0-E	2	26 years	0.0011	0.0280
2-186-1-L	2	20 years	0.0008	0.0156
2-207A-0-A	3	15 years	0.0010	0.0152
1-109-2	2	23 years	0.0006	0.0130
1-179-1-L	2	25 years	0.0003	0.0071
1-103-4-A	2	23 years	0.0003	0.0059
1-186-0-A	2	25 years	0.0002	0.0050
02-63-0-Q	2	26 years	0.0002	0.0050
1-186-2-Q	2	26 years	0.0001	0.0035

SPENCER
08/04/98
MODEL RUN 18-91

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . XRAY
CONFIGURATION . . . . Passive and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Non-Continuous Joiner Bulkheads

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0321	0.8341
2-82-0-E	2	26 years	0.0298	0.7747
3-103-0-E	2	26 years	0.0279	0.7241
3-152A-0-E	2	26 years	0.0271	0.7052
3-152-2-E	2	22 years	0.0311	0.6853
3-82-0-E	2	26 years	0.0181	0.4704
2-72-2-L	2	20 years	0.0211	0.4213
2-165-2-L	2	20 years	0.0049	0.0986
1-141-2-Q	2	26 years	0.0029	0.0764
1-117-0-L	2	24 years	0.0030	0.0719
1-117-2-L	2	24 years	0.0023	0.0557
1-129-2-Q	2	20 years	0.0026	0.0527
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0009	0.0230
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
1-169-1-L	2	25 years	0.0008	0.0193
3-47-0-C	2	26 years	0.0007	0.0189
1-165-3-L	2	24 years	0.0005	0.0131
2-207A-0-A	3	15 years	0.0008	0.0113
2-186-1-L	2	20 years	0.0005	0.0097
1-109-2	2	23 years	0.0004	0.0082
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0022
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 18-92

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . XRAY
CONFIGURATION . . . . Passive
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Non-Continuous Joiner Bulkheads

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0413	1.0747
2-82-0-E	2	26 years	0.0369	0.9600
3-152-2-E	2	22 years	0.0432	0.9508
3-103-0-E	2	26 years	0.0320	0.8330
3-152A-0-E	2	26 years	0.0306	0.7950
3-82-0-E	2	26 years	0.0211	0.5493
2-72-2-L	2	20 years	0.0263	0.5258
2-165-2-L	2	20 years	0.0080	0.1602
1-117-0-L	2	24 years	0.0043	0.1043
1-141-2-Q	2	26 years	0.0034	0.0889
1-117-2-L	2	24 years	0.0035	0.0849
1-129-2-Q	2	20 years	0.0031	0.0616
1-201-1-Q	2	21 years	0.0022	0.0454
1-169-1-L	2	25 years	0.0016	0.0400
1-165-3-L	2	24 years	0.0015	0.0359
2-47-1-C	2	26 years	0.0012	0.0301
02-48-0-C	2	26 years	0.0011	0.0299
3-47-0-C	2	26 years	0.0011	0.0288
3-228-0-E	2	26 years	0.0011	0.0280
2-186-1-L	2	20 years	0.0008	0.0156
2-207A-0-A	3	15 years	0.0010	0.0152
1-109-2	2	23 years	0.0006	0.0132
1-179-1-L	2	25 years	0.0003	0.0071
1-103-4-A	2	23 years	0.0003	0.0059
1-186-0-A	2	25 years	0.0002	0.0050
02-63-0-Q	2	26 years	0.0002	0.0050
1-186-2-Q	2	26 years	0.0001	0.0035

SPENCER
08/04/98
MODEL RUN 18-93

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Non-Continuous Joiner Bulkheads

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0321	0.8341
2-82-0-E	2	26 years	0.0298	0.7747
3-103-0-E	2	26 years	0.0279	0.7241
3-152A-0-E	2	26 years	0.0271	0.7052
3-152-2-E	2	22 years	0.0311	0.6853
3-82-0-E	2	26 years	0.0181	0.4704
2-72-2-L	2	20 years	0.0211	0.4213
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0022
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 18-94

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive and Automatic
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Non-Continuous Joiner Bulkheads

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0413	1.0747
2-82-0-E	2	26 years	0.0369	0.9600
3-152-2-E	2	22 years	0.0432	0.9508
3-103-0-E	2	26 years	0.0320	0.8330
3-152A-0-E	2	26 years	0.0306	0.7950
3-82-0-E	2	26 years	0.0211	0.5493
2-72-2-L	2	20 years	0.0263	0.5258
2-165-2-L	2	20 years	0.0080	0.1602
1-117-0-L	2	24 years	0.0036	0.0865
1-117-2-L	2	24 years	0.0031	0.0741
1-129-2-Q	2	20 years	0.0027	0.0535
1-141-2-Q	2	26 years	0.0020	0.0516
1-201-1-Q	2	21 years	0.0022	0.0454
1-165-3-L	2	24 years	0.0014	0.0345
1-169-1-L	2	25 years	0.0014	0.0342
2-47-1-C	2	26 years	0.0012	0.0301
02-48-0-C	2	26 years	0.0011	0.0299
3-47-0-C	2	26 years	0.0011	0.0288
3-228-0-E	2	26 years	0.0010	0.0254
2-186-1-L	2	20 years	0.0007	0.0135
1-109-2	2	23 years	0.0006	0.0130
1-179-1-L	2	25 years	0.0003	0.0071
2-207A-0-A	3	15 years	0.0005	0.0069
1-103-4-A	2	23 years	0.0003	0.0059
1-186-0-A	2	25 years	0.0002	0.0050
02-63-0-Q	2	26 years	0.0002	0.0050
1-186-2-Q	2	26 years	0.0001	0.0035

SPENCER
08/04/98
MODEL RUN 18-95

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Non-Continuous Joiner Bulkheads

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0321	0.8341
2-82-0-E	2	26 years	0.0298	0.7747
3-103-0-E	2	26 years	0.0279	0.7241
3-152A-0-E	2	26 years	0.0271	0.7052
3-152-2-E	2	22 years	0.0311	0.6853
3-82-0-E	2	26 years	0.0181	0.4704
2-72-2-L	2	20 years	0.0211	0.4213
2-165-2-L	2	20 years	0.0049	0.0986
1-141-2-Q	2	26 years	0.0029	0.0764
1-117-0-L	2	24 years	0.0030	0.0719
1-117-2-L	2	24 years	0.0023	0.0557
1-129-2-Q	2	20 years	0.0026	0.0527
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
1-169-1-L	2	25 years	0.0008	0.0193
3-47-0-C	2	26 years	0.0007	0.0189
1-165-3-L	2	24 years	0.0005	0.0131
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0022
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 18-96

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Non-Continuous Joiner Bulkheads

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0413	1.0747
2-82-0-E	2	26 years	0.0369	0.9600
3-152-2-E	2	22 years	0.0432	0.9508
3-103-0-E	2	26 years	0.0320	0.8330
3-152A-0-E	2	26 years	0.0306	0.7950
3-82-0-E	2	26 years	0.0211	0.5493
2-72-2-L	2	20 years	0.0263	0.5258
2-165-2-L	2	20 years	0.0080	0.1602
1-117-0-L	2	24 years	0.0043	0.1043
1-141-2-Q	2	26 years	0.0034	0.0889
1-117-2-L	2	24 years	0.0035	0.0849
1-129-2-Q	2	20 years	0.0031	0.0616
1-201-1-Q	2	21 years	0.0022	0.0454
1-169-1-L	2	25 years	0.0016	0.0400
1-165-3-L	2	24 years	0.0015	0.0359
2-47-1-C	2	26 years	0.0012	0.0301
02-48-0-C	2	26 years	0.0011	0.0299
3-47-0-C	2	26 years	0.0011	0.0288
3-228-0-E	2	26 years	0.0010	0.0254
2-186-1-L	2	20 years	0.0007	0.0135
1-109-2	2	23 years	0.0006	0.0132
1-179-1-L	2	25 years	0.0003	0.0071
2-207A-0-A	3	15 years	0.0005	0.0069
1-103-4-A	2	23 years	0.0003	0.0059
1-186-0-A	2	25 years	0.0002	0.0050
02-63-0-Q	2	26 years	0.0002	0.0050
1-186-2-Q	2	26 years	0.0001	0.0035

SPENCER
08/04/98
MODEL RUN 17-85

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

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TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0321	0.8357
2-82-0-E	2	26 years	0.0299	0.7776
3-103-0-E	2	26 years	0.0280	0.7274
3-152A-0-E	2	26 years	0.0272	0.7072
3-152-2-E	2	22 years	0.0311	0.6853
3-82-0-E	2	26 years	0.0181	0.4715
2-72-2-L	2	20 years	0.0211	0.4219
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 20-105

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 2-82-0-E, A=25%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0316	0.8220
3-103-0-E	2	26 years	0.0274	0.7112
3-152A-0-E	2	26 years	0.0268	0.6960
2-82-0-E	2	26 years	0.0261	0.6777
3-152-2-E	2	22 years	0.0307	0.6748
3-82-0-E	2	26 years	0.0180	0.4677
2-72-2-L	2	20 years	0.0185	0.3703
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 21-106

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 2-82-0-E, A=50%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0310	0.8072
3-103-0-E	2	26 years	0.0267	0.6947
3-152A-0-E	2	26 years	0.0263	0.6840
3-152-2-E	2	22 years	0.0301	0.6633
2-82-0-E	2	26 years	0.0219	0.5706
3-82-0-E	2	26 years	0.0178	0.4639
2-72-2-L	2	20 years	0.0158	0.3153
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 22-107

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 2-82-0-E, A=75%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0304	0.7913
3-103-0-E	2	26 years	0.0261	0.6792
3-152A-0-E	2	26 years	0.0258	0.6717
3-152-2-E	2	22 years	0.0296	0.6513
2-82-0-E	2	26 years	0.0181	0.4703
3-82-0-E	2	26 years	0.0177	0.4599
2-72-2-L	2	20 years	0.0132	0.2635
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 23-108

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 2-82-0-E, A=100%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0300	0.7791
3-103-0-E	2	26 years	0.0255	0.6642
3-152A-0-E	2	26 years	0.0255	0.6623
3-152-2-E	2	22 years	0.0292	0.6422
3-82-0-E	2	26 years	0.0175	0.4559
2-82-0-E	2	26 years	0.0140	0.3636
2-72-2-L	2	20 years	0.0104	0.2088
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 17-85

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0321	0.8357
2-82-0-E	2	26 years	0.0299	0.7776
3-103-0-E	2	26 years	0.0280	0.7274
3-152A-0-E	2	26 years	0.0272	0.7072
3-152-2-E	2	22 years	0.0311	0.6853
3-82-0-E	2	26 years	0.0181	0.4715
2-72-2-L	2	20 years	0.0211	0.4219
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 24-109

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 3-82-0-E, A=25%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0316	0.8211
2-82-0-E	2	26 years	0.0283	0.7360
3-103-0-E	2	26 years	0.0274	0.7114
3-152A-0-E	2	26 years	0.0268	0.6960
3-152-2-E	2	22 years	0.0306	0.6733
2-72-2-L	2	20 years	0.0207	0.4143
3-82-0-E	2	26 years	0.0158	0.4098
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 25-110

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 3-82-0-E, A=50%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0310	0.8056
3-103-0-E	2	26 years	0.0268	0.6961
2-82-0-E	2	26 years	0.0266	0.6918
3-152A-0-E	2	26 years	0.0263	0.6848
3-152-2-E	2	22 years	0.0300	0.6604
2-72-2-L	2	20 years	0.0203	0.4066
3-82-0-E	2	26 years	0.0132	0.3437
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 26-111

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 3-82-0-E, A=75%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0304	0.7892
3-103-0-E	2	26 years	0.0262	0.6802
3-152A-0-E	2	26 years	0.0259	0.6723
2-82-0-E	2	26 years	0.0250	0.6503
3-152-2-E	2	22 years	0.0294	0.6469
2-72-2-L	2	20 years	0.0199	0.3981
3-82-0-E	2	26 years	0.0108	0.2820
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 27-112

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 3-82-0-E, A=100%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0299	0.7766
3-103-0-E	2	26 years	0.0256	0.6650
3-152A-0-E	2	26 years	0.0255	0.6632
3-152-2-E	2	22 years	0.0289	0.6365
2-82-0-E	2	26 years	0.0233	0.6061
2-72-2-L	2	20 years	0.0196	0.3913
3-82-0-E	2	26 years	0.0083	0.2159
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 17-85

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Baseline, In-Port M Values

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0321	0.8357
2-82-0-E	2	26 years	0.0299	0.7776
3-103-0-E	2	26 years	0.0280	0.7274
3-152A-0-E	2	26 years	0.0272	0.7072
3-152-2-E	2	22 years	0.0311	0.6853
3-82-0-E	2	26 years	0.0181	0.4715
2-72-2-L	2	20 years	0.0211	0.4219
2-165-2-L	2	20 years	0.0049	0.0986
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 28-113

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 3-103-0-E, A=25%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0275	0.7147
2-82-0-E	2	26 years	0.0249	0.6467
3-152A-0-E	2	26 years	0.0243	0.6330
3-103-0-E	2	26 years	0.0228	0.5924
3-152-2-E	2	22 years	0.0266	0.5860
3-82-0-E	2	26 years	0.0150	0.3908
2-72-2-L	2	20 years	0.0179	0.3581
2-165-2-L	2	20 years	0.0043	0.0867
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 29-114

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 3-103-0-E, A=50%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

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TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152-0-E	2	26 years	0.0227	0.5903
3-152A-0-E	2	26 years	0.0215	0.5580
2-82-0-E	2	26 years	0.0197	0.5131
3-152-2-E	2	22 years	0.0220	0.4840
3-103-0-E	2	26 years	0.0175	0.4541
3-82-0-E	2	26 years	0.0119	0.3083
2-72-2-L	2	20 years	0.0146	0.2930
2-165-2-L	2	20 years	0.0037	0.0746
1-117-0-L	2	24 years	0.0025	0.0596
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 30-115

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 3-103-0-E, A=75%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152A-0-E	2	26 years	0.0186	0.4837
3-152-0-E	2	26 years	0.0181	0.4694
3-152-2-E	2	22 years	0.0175	0.3849
2-82-0-E	2	26 years	0.0147	0.3823
3-103-0-E	2	26 years	0.0123	0.3198
2-72-2-L	2	20 years	0.0115	0.2292
3-82-0-E	2	26 years	0.0087	0.2275
1-117-0-L	2	24 years	0.0025	0.0596
2-165-2-L	2	20 years	0.0029	0.0587
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013

SPENCER
08/04/98
MODEL RUN 31-116

INDIVIDUAL TARGET OPTION - SUMMARY LEVEL REPORT

RELATIVE LOSS FACTORS OF INDIVIDUAL TARGETS

READINESS CONDITION . YOKE
CONFIGURATION . . . . Passive, Automatic, and Manual
CASE. . . . . Worst
ASSUMED LOCATION. . . in Port
RUN TIME. . . . . 60 minutes
COMMENTS. . . . . .
Alternative, Analysis of Automated Systems 3-103-0-E, A=100%

Targets listed include all compartments in model run with Magnitude of Acceptable Loss 1-3 and Relative Loss Factor (RLF) > 0.0000.

TARGET COMPART.	Magnitude/Frequency -of Acceptable Loss-		Rel Freq of Loss|FFS	Relative Loss Factor (RLF)
3-152A-0-E	2	26 years	0.0158	0.4097
3-152-0-E	2	26 years	0.0133	0.3455
3-152-2-E	2	22 years	0.0129	0.2837
2-82-0-E	2	26 years	0.0096	0.2487
3-103-0-E	2	26 years	0.0070	0.1824
2-72-2-L	2	20 years	0.0082	0.1641
3-82-0-E	2	26 years	0.0056	0.1450
1-117-0-L	2	24 years	0.0025	0.0596
2-165-2-L	2	20 years	0.0025	0.0505
1-117-2-L	2	24 years	0.0021	0.0494
1-129-2-Q	2	20 years	0.0023	0.0467
1-141-2-Q	2	26 years	0.0018	0.0465
1-201-1-Q	2	21 years	0.0021	0.0438
3-228-0-E	2	26 years	0.0008	0.0210
02-48-0-C	2	26 years	0.0008	0.0205
2-47-1-C	2	26 years	0.0007	0.0194
3-47-0-C	2	26 years	0.0007	0.0189
1-169-1-L	2	25 years	0.0007	0.0178
1-165-3-L	2	24 years	0.0005	0.0127
2-186-1-L	2	20 years	0.0004	0.0090
1-109-2	2	23 years	0.0004	0.0082
2-207A-0-A	3	15 years	0.0004	0.0054
1-179-1-L	2	25 years	0.0002	0.0045
1-186-2-Q	2	26 years	0.0001	0.0030
02-63-0-Q	2	26 years	0.0000	0.0026
1-186-0-A	2	25 years	0.0000	0.0019
1-103-4-A	2	23 years	0.0000	0.0013